



ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA-R05-OAR-2010-0954; FRL-9757-3]

**Approval and Promulgation of Air Quality Implementation Plans;
Michigan; Regional Haze State Implementation Plan; Federal
Implementation Plan for Regional Haze**

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: EPA is finalizing action on a State Implementation Plan (SIP) submittal from the State of Michigan dated November 5, 2010, addressing regional haze for the first implementation period (ending in 2018). This action is being taken in accordance with the Clean Air Act and EPA's rules for states to prevent and remedy future and existing anthropogenic impairment of visibility in mandatory Class I areas through a regional haze program. EPA finds that Michigan meets several regional haze planning requirements, including identification of affected Class I areas, provision of a monitoring plan, consultation with other parties, and adoption of a long-term strategy providing for reasonable progress except to the extent Michigan's plan failed to require best available retrofit technology (BART). As part of this action, EPA finds that the State's submittal addressed BART for some sources but failed to satisfy BART for

two sources, namely St. Marys Cement (SMC) and Escanaba Paper Company (Escanaba Paper). EPA is promulgating a Federal Implementation Plan (FIP) including nitrogen oxide (NO_x) emission limits for these two sources in addition to sulfur dioxide (SO₂) emission limits for SMC to satisfy these requirements.

DATES: This final rule is effective on **[insert date 30 days after publication in the Federal Register]**.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA-R05-OAR-2010-0954. All documents are listed on the www.regulations.gov Web site. Although listed in the index, some information is not publicly available, i.e., Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through www.regulations.gov or in hard copy at the Environmental Protection Agency, Region 5, Air and Radiation Division, 77 West Jackson Boulevard, Chicago, Illinois 60604. This facility is open from 8:30 AM to 4:30 PM, Monday through Friday, excluding Federal holidays. We recommend that you

telephone Charles Hatten, Environmental Engineer, at (312) 886-6031 before visiting the Region 5 office.

FOR FURTHER INFORMATION CONTACT: Charles Hatten, Environmental Engineer, Control Strategies Section, at 312-886-6031, hatten.charles@epa.gov, regarding all elements of the action, or John Summerhays, Environmental Scientist, Attainment Planning and Maintenance Section, at 312-886-6067, summerhays.john@epa.gov, regarding issues relating to BART.

Both contacts may be reached by mail at Air Programs Branch (AR-18J), Environmental Protection Agency, Region 5, 77 West Jackson Boulevard, Chicago, Illinois 60604.

SUPPLEMENTARY INFORMATION: This supplementary information section is arranged as follows:

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- III. What are EPA's Final BART Determinations?
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I. Synopsis of Proposed Rule

Michigan submitted a plan to address regional haze on November 5, 2010. This plan was intended to address the

requirements in Clean Air Act section 169A, as interpreted in EPA's Regional Haze Rule as codified in Title 40 Code of Federal Regulations (CFR) 51.308. The Regional Haze Rule was promulgated on July 1, 1999 (64 FR 35713), with further significant provisions promulgated on July 6, 2005 (70 FR 39104), that provided guidance related to BART.

On August 6, 2012 (77 FR 46912), EPA proposed action on Michigan's submittal addressing the Regional Haze Rule for the first implementation period, ending in 2018. That action described the nature of the regional haze problem and the statutory and regulatory background for EPA's review of Michigan's regional haze plan. The action also described at length the regional haze requirements, including requirements for mandating BART, consultation with other states in establishing goals representing reasonable further progress in mitigating anthropogenic visibility impairment, and adoption of limitations as necessary to implement a long-term strategy for reducing visibility impairment.

EPA proposed to approve Michigan's identification of five non-electric generating unit (non-EGU) sources as having sufficient impact to warrant being subject to emission limits representing BART. The five non-EGU BART-eligible sources included Lafarge Midwest, Inc.; SMC; Escanaba Paper (referenced

in the proposed rulemaking as NewPage Paper Company); Smurfit Stone Container Corp.; and Tilden Mining Company.

Michigan made source-specific determinations of BART for these non-EGU sources. In the August 6, 2012 proposed rulemaking, EPA proposed to approve Michigan's BART requirements for some of the non-EGUs, based on a Federal consent decree requiring new controls for SO₂ and NO_x emissions for the Lafarge Midwest plant and based on existing limits at Smurfit Stone. EPA proposed to disapprove Michigan's plan for BART at SMC's facility in Charlevoix (SMC-Charlevoix) and at Escanaba Paper's facility in Escanaba. Specifically, EPA proposed to disapprove the NO_x and SO₂ BART determination for the cement kiln and associated equipment at SMC-Charlevoix and the NO_x BART determination for Boiler 8 and 9 at Escanaba Paper. Further, EPA proposed a FIP to impose BART NO_x and SO₂ limits for the cement kiln and associated equipment for SMC-Charlevoix, and BART NO_x limits for Boilers 8 and 9 at Escanaba Paper. EPA proposed no action regarding Tilden Mining, since that facility is a taconite plant that is being addressed in a separate action that also addresses taconite plants in Minnesota.

II. Public Comments and EPA's Responses

The publication of EPA's proposed rule initiated a 30-day public comment period that ended on September 5, 2012. During

this public comment period, EPA received comments from the United States National Park Service (National Park Service), the State of Michigan Department of Environmental Quality (MDEQ), Lafarge Midwest Inc., Escanaba Paper, SMC, and Cliffs Natural Resources Inc. (Cliffs).

EPA also offered to hold a public hearing, upon request, to provide interested parties the opportunity to provide oral comments on the FIP proposal. As discussed below, one commenter requested a hearing in order to make comments not relevant to the FIP proposal for SMC-Charlevoix or Escanaba Paper. EPA denied this request. As no commenter requested to make oral comments on the proposed FIP, EPA did not hold a public hearing. Following is a summary of the comments submitted and EPA's responses.

National Park Service

Comment: National Park Service commented on EPA's proposed actions regarding BART for electric utilities. National Park Service noted that on June 7, 2012, EPA disapproved Michigan's regional haze plan (and several other states' plans) that relied on the Clean Air Interstate Rule (CAIR) to meet BART for electric utilities, and promulgated FIPs that relied on the Cross State Air Pollution Rule (CSAPR) to meet BART. National Park Service also noted the August 21, 2012, decision by the

U.S. Court of Appeals for the District of Columbia to vacate CSAPR and to leave CAIR temporarily in place. "Because EPA previously disapproved the state plans that relied on CAIR to meet BART, it appears that EPA cannot finalize the proposed approval of BART for electric utilities in Michigan." National Park Service recommended instead that Michigan evaluate BART for those electric utilities.

Response: The rulemaking EPA is finalizing today does not address BART for EGUs in Michigan. As noted in our proposed rulemaking, published on August 6, 2012, EPA had already taken action on BART for EGUs in Michigan and a number of other states in a separate rulemaking, published on June 7, 2012 (77 FR 33642). Thus, the comment is not pertinent to this action.

Comment: National Park Service commented that Michigan's reasonable progress goals based on the air quality modeling for Seney Wilderness Area appear to project that visibility on the 20 percent best days will be poorer in 2018 (7.7 deciviews (dv)) than in the 2000 to 2004 baseline period (7.14 dv).

Response: As discussed in section 5.2 of Michigan's submittal, best-days visibility in 2018 is projected to be modestly worse than visibility in 2000 to 2004. Notwithstanding this modeling result, EPA has several reasons to anticipate that visibility on the best days in 2018 may in fact be better and not worse than

baseline best-days visibility. First, as seen in the most recent air quality data, best-days visibility in these areas has been improving, for example improving at Seney from a 2000 to 2004 average of 7.1 deciviews to a 2005 to 2009 average of 6.4 deciviews. (See

http://vista.cira.colostate.edu/improve/Publications/Reports/2011/PDF/Appendix_G.pdf, page G-109.) Second, as Michigan noted in

its submittal, the projection that visibility on the best days will worsen reflects an uncertain estimate of increasing ammonia emissions. Emissions of the other emitted pollutants important to visibility, especially SO₂ and NO_x, have decreased significantly, and are expected to continue to decline. As Michigan noted, an alternate plausible assumption that ammonia emissions are not increasing would be expected to support a finding that visibility on best-visibility days will improve.

Third, recent modeling that EPA has done in support of CSAPR showed that visibility on best visibility days at Seney is expected to improve by 2014 even without CAIR or CSAPR. Fourth, oftentimes the air mass on best visibility days in Northern Michigan originates in Canada, for which the emission inventories used in the air quality modeling for the SIP are less reliable. Finally, Michigan noted some unmodeled emission reductions, such as those from BART for non-EGUs, that would be

expected to lead to better visibility in 2018 than that shown in its SIP. For these reasons, EPA expects that Michigan's plan will yield visibility on the best 20 percent of days at its Class I areas in 2018 that will be either the same as or better than during the baseline period.

MDEQ

Comment: MDEQ objected to EPA's action proposing a FIP to mandate BART for SMC in Charlevoix and Escanaba Paper in Escanaba to meet regional haze visibility goals and simultaneously proposing disapproval of Michigan's plan for these sources. By doing so, Michigan commented, EPA is circumventing the process laid out in the Clean Air Act by not giving the State the opportunity to correct deficiencies in Michigan's BART SIP revision. Michigan references the August 12, 2012, opinion of the U.S. Court of Appeals for the D.C. Circuit in *EME Homer City Generation, L.P. v. EPA* (addressing CSAPR), an opinion that, in Michigan's view, concluded that a FIP-first process is not in accordance with the Clean Air Act.

Response: EPA disagrees with this comment. Rather than circumventing the Clean Air Act, EPA is in fact complying with the Clean Air Act's requirements. Under section 110(c)(1) of the Clean Air Act, EPA must promulgate a FIP within 2 years of a finding of failure to submit a required SIP submittal. This

requirement for FIP promulgation was triggered by a finding published on January 15, 2009 (74 FR 2392), that Michigan and other states had failed to submit the required regional haze SIP. Michigan submitted its regional haze plan on November 5, 2010. EPA informed Michigan on multiple occasions that it did not expect to be able to approve the State's BART determinations for at least SMC and Escanaba Paper. Since Michigan did not submit a SIP with BART limits that EPA could approve as consistent with the Clean Air Act, EPA is obligated to promulgate FIP limits meeting BART requirements.

This situation is different from the situation addressed by the court in the *EME Homer City Generation* opinion. In the *EME Homer City Generation* litigation, a key concern raised by the court was whether EPA had provided states suitable guidance on the pertinent requirement and thus whether the states had a meaningful opportunity to meet the requirement. In this case, EPA promulgated regulations defining the criteria for meeting the BART requirement in 2005, and so there can be no question that Michigan had adequate opportunity to meet the BART requirements, both in its initial submittal and after EPA expressed concern that Michigan's submittal appeared inadequate. Today's action is more than two years later than the State's submittal, so EPA did not apply a "FIP-first process." The

circumstances are very different and therefore EPA does not agree that the *EME Homer City Generation* opinion is relevant to EPA's proposed rule on August 6, 2012. However, EPA would welcome Michigan's submittal of a SIP to replace the FIP and will work with the State to approve expeditiously a SIP that suitably replaces the requirements EPA is promulgating today.

Lafarge Midwest Inc.

Comment: Steve Kohl (Partner Warner Norcross & Judd LLP, Bodman Attorney & Associates) commented on behalf of his client, Lafarge Midwest Inc., that there was a typographic error in EPA's proposed approval of MDEQ's BART determination that compliance with the currently applicable Portland Cement - Maximum Achievable Control Technology (MACT) emission standard satisfies BART requirements for particulate matter (PM). EPA's proposal, as published, erroneously cites an emission standard of 0.030 pounds (lb) per ton of dry feed. The correct Portland Cement MACT emission standard is 0.30 lb per ton of dry feed.

Response: EPA acknowledges the typographic error and agrees that the Portland Cement MACT PM emission standard is 0.30 lb per ton of dry feed.

Escanaba Paper

EPA received a set of comments from Escanaba Paper addressing features of the proposed FIP for the Number 8 and

Number 9 Boilers at the company's Escanaba facility.

Comment: Escanaba Paper commented that on page 46922 of the preamble and all instances thereafter, all references to NewPage Paper should be corrected and revised to reflect the correct legal entity - Escanaba Paper Company (EPC). The Escanaba Paper Company is the correct legal entity and is consistent with how the mill is identified in various business and Michigan regulatory programs (e.g., the Title V permit is issued to the Escanaba Paper Company).

Response: Per the company's request, EPA has revised all references to identify the company that owns the pertinent facility as Escanaba Paper Company (or, as shorthand in this preamble, Escanaba Paper).

Comment: Page 46922 of the preamble makes mention of the costs associated with controlling emissions on the Number 8 and Number 9 Boilers at Escanaba Paper. Escanaba Paper noted that supplemental and updated information concerning control equipment costs were submitted to both MDEQ and EPA Region 5. Escanaba Paper believes that the supplemental and updated information confirm the conclusion that the addition of control equipment is unwarranted.

Response: EPA notes the supplemental information, which supports EPA's proposed action, which proposed limits that EPA believes

can be met without additional control beyond control Escanaba Paper has already installed.

Comment: On page 46924 of the preamble, EPA stated that low NOx burners would achieve 40 percent reduction of emissions on the Number 8 Boiler and then uses this control efficiency to calculate cost effectiveness. Escanaba Paper noted that conversations with low NOx burner vendors did not confirm that an annual 40 percent control efficiency is achievable, thus the cost effectiveness referenced by EPA could be higher.

Response: EPA used estimates of costs and benefits of control to conclude that emission control relative to baseline emissions would be cost effective. Escanaba Paper has implemented controls similar to those that EPA judged to be cost effective, which, in absence of a limit requiring these controls, suggests that Escanaba Paper also finds these controls to be cost effective. Escanaba Paper does not suggest specific alternate cost effectiveness assumptions. EPA believes that low NOx burners can achieve 40 percent control, supporting EPA's cost effectiveness evaluation, but EPA could assume lesser control efficiency and higher costs per ton for a low NOx burner and would still find the limits it proposed to be cost effective.

Comment: On pages 46924 and 46925 of the preamble, EPA Region 5 stated that Escanaba Paper installed a flue gas recirculation

system on the Number 8 Boiler to meet MDEQ ozone season NOx limits. Escanaba Paper noted that it can currently meet the ozone season NOx emission limits with or without operation of the flue gas recirculation system on the Number 8 Boiler.

Response: EPA noted that Escanaba Paper had installed a flue gas recirculation system to point out that it gives the company an additional option for meeting the limit that EPA is promulgating for this boiler.

Comment: Escanaba Paper noted that EPA references a "worst-case" annual NOx emission rate of 1,300 tons per year for the Number 8 Boiler. This annualized rate appears to be extrapolated by EPA and is unrepresentative of annual actual emissions. Escanaba Paper cannot verify the basis for this annualized NOx emission rate but notes that current 2011 NOx emissions of 33 tons are more than 1,200 tons less than those referenced by EPA.

EPA guidance for conducting the BART visibility modeling is to use a worst-case, short-term emission rate (i.e., a 24-hour emission rate) for BART applicability determinations but to use annual actual emissions for assessing cost effectiveness. It is inappropriate to interchange these emission rates in these analyses. Further, Escanaba Paper believes that if current, worst-case short-term visibility impairing pollutant emission rates for all of the BART emission units at the mill were

evaluated in a visibility modeling analysis, there would be no days that exceed a 0.5 dv level.

Response: EPA agrees that the annualizing of a short-term worst case emission rate does not necessarily yield a realistic estimate of emissions for the facility being addressed here. While EPA is not speculating on the number of days that would exceed 0.5 dv impact at current worst case emission rates, EPA believes that the uncontrolled emissions are sufficiently high and the cost of controls sufficiently reasonable to warrant a determination that controls such as those that Escanaba Paper has added represent BART.

Comment: EPA proposed to limit emissions from the Number 8 Boiler according to a weighted average of fuel specific emission limits, as discussed on page 46925 of the preamble. In lieu of these limits, Escanaba Paper believes that a single emission limit is preferable. Escanaba Paper proposed a NOx emission limit of 0.35 lb of NOx per million British Thermal Units (MMBtu). To support this NOx emission limit for the Number 8 Boiler, Escanaba Paper noted the following:

- The 0.35 lb NOx/MMBtu limit is more restrictive than the 0.50 lbs NOx/MMBtu limit proposed for fuel oil,

- The 0.35 lb NO_x/MMBtu limit will limit Escanaba Paper's use of fuel oil, which has higher SO₂ and NO_x emissions than natural gas,

- A single emission limit decreases Escanaba Paper's recordkeeping requirements and improves the efficiency of Escanaba Paper's monitoring and reporting, and

- The 0.35 lb NO_x/MMBtu emission limit is consistent with EPA's approach to determining an emission limit based on continuous emission monitoring system (CEMS) data. As with the EPA approach used to establish a NO_x emission factor for the SMC kiln, the Escanaba Paper CEMS data show that for non-idling periods, a 0.35 lb NO_x/MMBtu emission factor is equivalent to the 95th percentile 30-day average CEMS value with a 5 percent compliance margin.

Response: As recommended by Escanaba Paper, EPA is promulgating a fixed limit of 0.35 lb of NO_x per MMBTU, in lieu of the proposed limit based on separate values for oil firing and gas firing (0.26 lb/MMBTU for gas firing and 0.50 lb/MMBTU for oil firing) and calculated as an average weighted according to the heat input for each fuel. While this limit is less restrictive when the company is firing only gas, the limit is more restrictive when the company is firing substantial quantities of oil. Since oil firing tends to result in higher emissions, a

fixed limit will provide incentive for the company to fire more natural gas and less oil. Finally, since this limit simply mandates control that is already being implemented, and there is no indication in the record that Escanaba Paper has any incentive to reduce the effectiveness of the existing controls system, EPA believes that the nature of the limit and its precise level in practice will not have a significant effect on actual emissions.

Comment: On page 46925 of the preamble at footnote 2, EPA provided an assessment of NO_x emission factors for the Number 8 Boiler for the 2008/2009 and 2010/2011 periods. Escanaba Paper was unable to reproduce the 2008/2009 value cited by EPA.

Response: In this footnote, EPA first cited 30-day average emission factors for 2010 and 2011, and then comments that "Operation in 2008 and 2009, during which the boiler was often oil-fired, yielded emission factors up to about 0.45 [lb]/MMBTU." As implied, this comment speaks to 30-day average emissions, and indeed the five highest average emission rates during 2008 and 2009 over 30 consecutive calendar days ranged from 0.44 to 0.48 lb/MMBTU. However, since Boiler Number 8 is operated to some degree as a backup to a larger (non-BART) boiler at the facility, it operates somewhat sporadically, so that 30 consecutive calendar days can include a substantial

number of non-operating days. Therefore, EPA is expressing the limit in terms of 30 consecutive operating days. Using this method of calculating 30-day averages, the highest value in 2008 to 2009 was 0.36 lb/MMBTU.

Comment: Escanaba Paper commented, "The extrapolation of visibility impacts is not linear. It is not possible to determine what visibility impacts associated with the NO_x emissions from the Number 9 Boiler would have occurred from improved combustion monitoring. Escanaba Paper also noted that emissions reported in 2002 and 2004 were likely overstated. Escanaba Paper updated the NO_x emission factor for the Number 9 Boiler in 2005 from the previous factors developed in 1992 and 1995."

Response: While deciviews are a logarithmic scale, a linear approximation is an appropriate means of estimating the impact of modest emission changes. In the analysis for this final rule, EPA has used the updated emissions information for the Number 9 Boiler.

Comment: Contrary to the language in the preamble, Escanaba Paper does not believe that the NO_x limits proposed at 40 CFR 52.1183(i)(4) "mandate the continued operation of the overfire air system that the company has installed on Boiler 9." Escanaba Paper wanted to confirm that there is no applicable

requirement being imposed that tracks the operational status of the overfire air system on the Number 9 Boiler.

Response: EPA confirms that no requirement is being imposed that directly mandates or tracks operation of the overfire air system on the Number 9 Boiler. Consistent with EPA's BART guidelines, EPA is setting an emission limit which requires emission control but is not mandating any particular means of meeting this limit. The statement in the preamble merely reflected EPA's expectation that the practical effect of setting the emission limit would be that Escanaba Paper would have to continue operating its overfire air system.

Comment: Escanaba Paper requested clarification as to whether the requirements of 40 CFR 52.1183(i) should apply no later than five years after EPA approves the FIP per the compliance schedule contained in of 40 CFR 51 Appendix Y or "upon the effective date of the rulemaking promulgating these limits."

(See page 46925 of the preamble of the proposed rule.)

Response: The Clean Air Act requires sources to meet BART limits as expeditiously as practicable. Escanaba Paper does not need to install any control devices to achieve the BART limit established in our FIP, and so EPA believes Escanaba Paper can meet the BART limits immediately. Therefore, "expeditiously as practicable" means immediate compliance for Escanaba Paper.

Thus, the codification of these limits provides no delayed compliance date, and therefore the limits apply as soon as this final rule becomes effective.

Comment: The reference to 40 CFR 60 appendix B, performance specification 2, at 40 CFR 52.1183(i)(2) is not necessary. Escanaba Paper has already conducted the initial start-up of the NOx CEMS on the Number 8 Boiler and thus the reference to performance specification 2 is not appropriate. In fact, performance specification 2 states that it is not for evaluating CEMS performance over a long period as seems to be the intention of this requirement. Escanaba Paper requests clarification or elimination of this specific requirement.

Response: EPA agrees with Escanaba Paper's comment and in the final FIP is not requiring compliance with performance specification 2.

Comment: The reference to 40 CFR 60 appendix B performance specification 2 at 40 CFR 52.1183(i)(3) should be replaced with a reference to 40 CFR 60 appendix F. Escanaba Paper requests clarification or modification of this specific requirement.

Response: EPA agrees with Escanaba Paper's comment. Requirements for ongoing quality assurance of continuous emission monitors are specified in 40 CFR 60 appendix F, not in 40 CFR 60 appendix B performance specification 2. EPA is

promulgating 40 CFR 52.1183(i)(3) with the recommended modification.

Comment: Escanaba Paper requests that the procedures outlined in 40 CFR 60 appendix F be used to determine the 30-day rolling average. The use of appendix F would also be consistent with the guidance contained in 40 CFR 51 appendix Y.

Response: 40 CFR 60 appendix F addresses quality assurance procedures, not procedures for 30-day averaging. Nevertheless, consistent with the apparent intent of this comment, and consistent with the guidance in 40 CFR 51 appendix Y, EPA is setting the limit for the Number 8 Boiler based on the average of emissions for 30 consecutive boiler operating days, where a day is defined as a boiler operating day if fuel is combusted at any time during the 24-hour period.

Comment: Escanaba Paper requested that the phrasing "Compliance stack test results" be used to replace 40 CFR 52.1183(i)(6)(ii), which as proposed read "All stack test results." In a separate comment, Escanaba Paper requested that the word "compliance" be inserted after "shall submit reports of any" at 40 CFR 52.1183(i)(6)(v).

Response: The first of these comments requests that Escanaba Paper only be required to keep records of emission tests mandated by EPA or the State for purposes of compliance

assessment, and that Escanaba Paper not be required to keep records of tests conducted for the company's own purposes. The second of these comments requests that the company not be required to report the results of such tests to EPA. Consistent with its general practice, EPA in this final rule is requiring the company to keep records of such tests but is not requiring the company to report the results of such tests. If a subsequent compliance test, requested by the State or EPA, shows noncompliance, the retained record of the nonmandated test would provide useful information, for example regarding the duration of noncompliance. (If a subsequent test shows compliance, the State and EPA would have little reason to inquire about nonmandated stack tests.) On the other hand, in the interests of encouraging Escanaba Paper to assess its compliance status whenever it has concerns about its emission rate, the final FIP does not require the company routinely to report results of emission tests that neither the State nor EPA requested, again consistent with its general practice. Thus, EPA has made the requested modification to 40 CFR 52.1183(i)(7)(v), but has not modified 40 CFR 52.1183(i)(6)(ii).

Comment: Escanaba Paper requested that the phrase "or when Boiler 8 is not operating" be inserted after "except for zero and span adjustments and calibration check". As the applicable

requirement is currently written, if the CEMS is not operated because the Boiler Number 8 is not operating, a quarterly report must document this situation.

Response: This final rule reflects the requested modification. EPA does not intend to require Escanaba Paper to document non-operation of its CEMS for times when its boiler is not operating.

SMC

Cortney Schmidt, environmental manager at SMC-Charlevoix, submitted comments on the proposed rulemaking on September 4, 2012. These comments elaborated on comments in a separate letter that Mr. Schmidt sent on August 2, 2012. Mr. Schmidt further sent a letter on August 8, 2012, responding to questions from EPA.¹

Comment: SMC found it unfortunate that EPA did not communicate directly with SMC much earlier in the process, because "surprising SMC at the last minute" foreclosed opportunities for "more deliberate, collaborative action."

Response: EPA submitted comments to Michigan on June 23, 2010,

¹ EPA has had a number of meetings and discussions with SMC since proposing action on Michigan's regional haze plan and the FIP imposing BART limits on SMC and Escanaba Paper. On November 12, 2012, SMC electronically submitted additional comments in which it asserts that the Charlevoix plant is not BART-eligible because construction that took place at the plant in 1979 constituted a "reconstruction" for BART applicability purposes. This issue was not raised in Michigan's SIP submittal or in SMC's previous written comments. Nevertheless, EPA will carefully review the new comments and take any action warranted. However, because it did not receive the comments until it was in the last stages of preparing this final action, well after the close of the comment period, EPA could not consider the comments in taking this action.

stating, "We disagree with MDEQ's assessment that a selective non-catalytic reduction system is technically infeasible and not cost-effective." EPA provided more detailed comments, including an assessment of the cost-effectiveness of a selective noncatalytic reduction system (SNCR), to Michigan by email on December 8, 2011. At EPA's request, Michigan forwarded these emailed comments to SMC. Finally, EPA sent comments to Michigan on May 24, 2012, and emailed a copy of the comment letter directly to SMC. Thus, EPA has ensured that SMC was aware of EPA's position and had opportunities to engage in discussions regarding the proposed BART determination for SMC-Charlevoix.

Comment: SMC quoted from three Federal circuit court opinions that, in SMC's view, demonstrate that EPA's proposal to disapprove "the portion of Michigan's SIP related to BART requirements for [SMC-Charlevoix]," and "to substitute EPA's own limits in their place, is impermissible under the Clean Air Act." Specifically, SMC asserted that the U.S. Court of Appeals for the D.C. Circuit in *EME Homer City Generation, LP v. EPA*, No. 11-1302 (D.C. Cir. August 21, 2012) and the U.S. Court of Appeals for the Fifth Circuit in *Luminant Generation Co. V. EPA*, 675 F.3d 917 (5th Cir. 2012) and *Texas v. EPA*, No. 10-60614 (5th Cir. August 13, 2012) held that if a state plan meets the standards required by the Clean Air Act, EPA cannot force the

states to adopt specific control measures.

Response: These decisions address rulemakings that are unrelated to regional haze and circumstances that do not invoke the same relationship between state and federal action. Moreover, these courts acknowledge that EPA has a valid role in assessing whether a state submittal is compliant with the Clean Air Act. EPA proposed to find that Michigan's submittal was not compliant with the Clean Air Act, insofar (in part) as Michigan failed to require BART for SMC-Charlevoix. SMC appears to be arguing that EPA may not disapprove a submittal that meets Clean Air Act requirements to force the State to adopt an alternative measure that EPA prefers, but EPA is not taking such an action here. Nor is EPA using the SIP process to force Michigan to adopt any particular control measure. Instead, EPA is simply fulfilling its responsibility to evaluate the State's submittal and, in the absence of a state submittal meeting applicable requirements, promulgating federal limits to meet these requirements.

Comment: SMC noted EPA's finding that Michigan's SIP "includes a reasonable set of measures that provide its appropriate share of reductions toward achieving reasonable progress goals." (See 77 FR 46919.) SMC concluded that, because the emissions limits proposed by Michigan allow the State to meet the reasonable

progress goals for improving visibility, "EPA cannot . . . require emissions limits for SMC which would go beyond allowing the State to meet those progress goals." SMC stated that the BART requirements are included within the set of emission limits that EPA may require only as "necessary to make reasonable progress."

Response: Clean Air Act section 169A(b)(2) provides that the measures that are necessary to provide for reasonable progress necessarily include measures representing BART. The fact that EPA codified BART requirements separately from the requirements for reasonable progress (in 40 CFR 51.308(e) versus 40 CFR 51.308(d)) supports an interpretation that BART requirements must be satisfied irrespective of whether reasonable progress goals are being met.

Another possible reading of section 169A(b)(2) is that a plan that lacks BART measures by definition fails to include all the measures that this section mandates be part of the plan for achieving reasonable progress. That is, under this interpretation, BART is necessarily a reasonable measure, and a plan, such as Michigan's, that fails to require BART cannot be considered to provide for reasonable progress.

In response to this comment, EPA is clarifying that, insofar as Michigan's plan fails to require BART on at least two

facilities, Michigan's plan fails to include all reasonable measures. To that extent, Michigan's plan may be considered to fail to provide for reasonable progress, but EPA believes that the plan, in combination with the FIP (in conjunction with BART limits for Tilden Mining, being addressed separately), meets reasonable progress requirements.

Comment: SMC cited six factors listed in the definition of BART at 40 CFR 51.301 that are to be taken into consideration in determining BART. With respect to the first factor, the technology available, SMC believes that "EPA did not properly evaluate the capabilities of technology available for NOx control at Charlevoix." SMC provided a review of the history of the SMC-Charlevoix kiln system design, including conversion in the late 1970s to a preheater/precalciner design and installation of an indirect firing system.

Response: EPA has considered the design of the SMC-Charlevoix kiln system in evaluating BART for this facility, as discussed more fully below.

Comment: SMC maintained that "the normal variability of NOx formation in cement kilns justifies the 6.5 pounds per ton NOx emission limit contained in Michigan's SIP." SMC provided a graph of emissions data for 2006 to 2008, and states that the "average of [these] data is 4.56 pounds per ton, but there is a

significant standard deviation of 0.64 pounds per ton, leading to a 99.7 [percent] confidence number of 6.47 pounds per ton."

Response: EPA recognizes the variability in NO_x formation at SMC-Charlevoix. EPA addressed this variability in its proposal in part by proposing a limit in the form of a 30-day average. Further discussion of the appropriate limit in the context of this variability is provided below.

The statistic SMC cites as being the 99.7th percentile (the value three standard deviations above the mean) is in fact an even higher percentile, specifically the 99.87th percentile. Although EPA is basing its limits on the 95th percentile baseline emissions, this error is worth noting because EPA is avoiding the same error in estimating the 95th percentile baseline emissions. This error presumably reflects confusion between two statistical values, one being the percent of values within three standard deviations both above and below the mean, and the other being the percent of values between zero and a value that is three standard deviations above the mean. The latter statistic is the appropriate statistic in finding percentiles, since a given percentile is the value that exceeds that percentage of the entire distribution, including values down to zero, not just the portion of the distribution down to another value for example three standard deviations below the mean. In a normal

distribution, 49.87 percent of values are between the mean and three standard deviations above the mean, and the same 49.87 percent of values are between three standard deviations below the mean and the mean, for a total of 99.74 percent of values within three standard deviations of the mean. In contrast, in determining percentile values, one must sum the 49.87 percent of values that are below three standard deviations above the mean but above the mean together with the full 50 percent of values that are below the mean. Thus, the value three standard deviations above the mean in a normal distribution is the 99.87th percentile value, not the 99.74th percentile value. For similar reasons, EPA is estimating 95th percentile baseline emissions as the value 1.645 standard deviations above the mean, rather than the value 1.96 standard deviations above the mean that SMC's approach would suggest.

Comment: SMC commented that it "has put in place more modern technology than its competitors, such as Lafarge's Alpena plant." Elsewhere, SMC cited other plants with higher emission limits which, it claims have "not been upgraded to the same degree as the Charlevoix plant," and noted that "SMC already outperforms those [limits] with the improvements it already has put in place."

Response: With the consideration of source-specific factors, as

required in determining BART at each facility, dissimilarities among facilities can yield dissimilarities in control requirements. Lafarge's Alpena facility has long wet kilns, a different design with inherently more NOx emissions than SMC-Charlevoix's preheater/pre-calciner kiln. In fact, BART at Lafarge requires similarly effective SNCR there as at SMC-Charlevoix, and BART at Lafarge requires sulfur emission control that is not required at SMC-Charlevoix.

Comment: SMC asserted that "EPA will expect compliance with its emission limit every day, not just 'on average' over several years. Therefore, EPA also was incorrect when it derived its proposed NOx emission limit of 2.3 [lb per ton] for the Charlevoix plant by applying a presumed 50 percent reduction against the plant's 4.56 [lb per ton] average, which was achieved over several years. . . . An 'average' value means that half of the actual performance is greater than that average. Therefore, any proposed reduction should not be applied to an average performance over several years, but instead must take into consideration the normal standard deviation from that average. This is the same rationale that was recently used by EPA in its agreement with Holcim's Montana Plant. Consequently, in this instance, if there was to be any reduction, it must be applied against the 6.5 [lb per ton] value

which represents the 99.7 percent confidence value of SMC's actual performance."

Response: SMC is noting the variability in emissions at SMC-Charlevoix, observing that a several year period will include many occasions with baseline emissions that are above average, and commenting that any emission limit should be based on those elevated baseline emission conditions. EPA addressed this concern in its proposed rulemaking. EPA proposed a limit that would require an average control of approximately 50 percent. In addition to defining the limit as a 30-day rolling average, EPA's notice of proposed rulemaking describes an examination of the variability of emissions at SMC-Charlevoix and the feasibility of achieving the proposed limit even during periods with greater emissions formation. The proposed rulemaking states, "According to 2006 to 2008 data from the facility, [the proposed limit] would require slightly under 60 percent control from St. Marys Cement's 95th percentile 30-day average emission rate, which the evidence from tests at St. Marys Cement's facility in Dixon, Illinois (SMC-Dixon) indicates is readily achievable, particularly since a limit of 2.30 lb per ton of clinker would only occasionally require this level of control." 77 FR 46924. Conversely, at the 5th percentile of the 30-day average emission rates, or 3.5 lb per ton, the proposed limit

would require only about 35 percent control. In this sense, EPA proposed a limit that would sometimes require about 60 percent control, sometimes require only about 35 percent control, and on average require slightly less than 50 percent control.

Thus, EPA considered the variability of baseline emissions but also considered the variability of control effectiveness in determining its proposed emission limit. Nevertheless, as discussed below, EPA is modifying its view of achievable control efficiencies and is modifying its approach for determining appropriate limits accordingly.

Comment: "Although better performing than other old plants, unique Charlevoix design features increase NO_x formation compared to the most modern kiln designs." SMC discussed the ratio of the kiln length to kiln diameter at SMC-Charlevoix, as well as the need to operate the kiln in an oxidizing atmosphere to minimize the likelihood of formation and buildup of calcium sulfate. SMC concluded that these factors raise the amount of energy needed to produce a kilogram of clinker from about 800 kilocalories to about 930 kilocalories, which raises expected NO_x emissions per ton of clinker.

Response: Average NO_x emissions at SMC-Charlevoix are about 4.5 lb per ton of clinker. According to the Compilation of Air Pollution Emission Factors (AP-42), average emissions for a

representative cement plant of the design of SMC-Charlevoix, i.e., a preheater/precalciner kiln, is 4.2 lb per ton of clinker. Thus, SMC-Charlevoix has very typical NO_x emissions for a facility of its type.

While it may be true that NO_x emissions at SMC-Charlevoix are slightly higher than those at newer plants, EPA is also setting a higher limit for SMC-Charlevoix than we have set for new cement plants. The new source performance standards for cement plants require NO_x emission rates not to exceed 1.5 lb per ton of clinker. Were EPA to require similar rates for SMC-Charlevoix, but allow for the 16 percent increase in heat input noted in the comment, EPA would be imposing an emission limit of 1.74 lb per ton of clinker, rather than the 30-day average limit of 2.8 lb per ton of clinker finalized in this rule.

Comment: "EPA's conclusion that SNCR will allow a 50 percent reduction in NO_x emissions from the Charlevoix plant is incorrect because the plant's design is incompatible with effective SNCR use." SMC argued that the achievement of emission rates as low as 2.3 lb per ton requires kiln design features "(e.g., proper kiln length to diameter dimensions and increased calciner retention time)" that are not present at SMC-Charlevoix. SMC provided a figure identifying temperatures and residence times at various locations within the kiln system, and

concludes that "nowhere in the kiln riser or flash calciner regions of the system does the plant reach the optimum temperature profile to support an effective SNCR reaction." SMC also found that the "residence time at Charlevoix is not adequate for use of SNCR." SMC provided a graph entitled "SNCR Efficiency based on Residence Time (Lab Trial)." SMC stated that at SMC-Charlevoix, "there is only a 0.11 second retention time between the reagent injection point and the time the system reaches the low end of efficiency point for the SNCR reaction." SMC further quotes EPA and other work suggesting that "larger plants had lower efficiencies than smaller sized plants."

SMC stated, "Actual test results demonstrate that SNCR will have only limited success in NO_x control at Charlevoix." SMC presented results of trial urea injections conducted in 2005 to test the NO_x reductions that an SNCR system might be expected to achieve. SMC described these tests as demonstrating that urea injection achieved less NO_x reduction than expected. SMC provided results in a table that gives average NO_x reduction percentages for four sets of tests, each conducted with urea injection at a different location in the kiln system and with a different urea injection rate. The table also gives urea injection rate in terms of the normalized stoichiometric ratio

(NSR).² "In one test run, [with an NSR equal to 1.07], the reduction was 36.8 percent However, that was coupled with a significant amount of ammonia slip, based on the theoretical calculations from the NOx present. The time frames for this trial were short, roughly several 10 minute runs to consolidate the average, and thus SMC is not confident that these reductions are sustainable." SMC provided a photograph that it considers to document excess ammonia (ammonia slip) appearing as a visible detached plume occurring at SMC-Charlevoix.

SMC provided a report from DeNOx Technologies describing the urea trials. SMC quoted from this report: "Typically, NOx reduction at a NSR of 1.0 is 40 - 60 percent; Charlevoix demonstrated 25-30 percent." In addition, SMC stated, "DeNOx's owner noted . . . that he had seen SNCR effectively solve NOx issues in multiple cement plants. However, he commented to SMC that he was amazed that SNCR is not as efficient in SMC's system, and he believed it must be because of Charlevoix's calciner design."

Response: EPA believes that the tests of SNCR at SMC-Charlevoix do not demonstrate that SNCR would be ineffective in reducing

² Normalized stoichiometric ratio expresses the ratio of the number of moles of ammonia equivalent to the pre-control number of moles of NOx. Each molecule of urea yields the equivalent of two molecules of ammonia. Thus, for example, if 0.6 moles of urea (yielding 1.2 moles of ammonia) are injected per mole of NOx, NSR = 1.2.

emissions, and in particular do not demonstrate that SMC could not meet the emission limits established in this final action. EPA notes that the tests SMC described were performed with urea rather than with ammonia, which is both more commonly used for this application and significantly more effective.

SMC-Charlevoix's test results were the subject of "SNCR emission control," published in the August 2006 edition of the journal International Cement Review (the Horton article).³ The article presents NOx reductions resulting from urea injection at "Plant B," which are the results found at SMC-Charlevoix. The article also includes contrasting results from testing at "Plant A," a plant with the same type of design as SMC-Charlevoix, demonstrating that NOx reductions of more than 50 percent could be achieved with ammonia injection at an NSR as low as 0.56 (i.e., the injection of only 0.56 moles of ammonia per mole of NOx). The article includes a graph showing that use of ammonia achieves higher NOx reductions than urea and has maximum efficiency at lower temperatures than urea. EPA views the 50 percent reduction at Plant A as more representative of the level of emission reduction that a properly designed and operated SNCR at SMC-Charlevoix could achieve. In fact, at the

3 Joe Horton, Suwannee American Cement/Votorantim Cimentos North America, Al Linero, Florida Department of Environmental Protection, and F. MacGregor Miller, Cement Etc., Inc, "SNCR Emission Control," International Cement Review, August 2006.

temperatures at SMC-Charlevoix cited by SMC, use of ammonia is expected to provide at least 40 percent more, and possibly greater than twice as much, NO_x reduction as is expected from use of urea. Thus, while SMC's concerns may apply to SNCR using urea, EPA believes that SMC can address these concerns by using ammonia.

EPA also believes that the DeNO_x Technologies report cited by SMC demonstrates that SMC-Charlevoix can achieve significant NO_x emission reductions even using urea. Table 1 presents relevant information derived from the DeNO_x Technologies report. During these trials, urea was injected at three locations: 1) after the kiln but before the tertiary air inlet, 2) in a duct after the tertiary air but before the precalciner, and 3) after the first stage of the preheater that is after the precalciner. In Table 1, the reduction per mole of reagent (ammonia equivalent) is computed by dividing the NO_x reduction percentage by the NSR.

Table 1. NO_x Emission Reductions at SMC-Charlevoix from Injection of Urea

Location	Reagent Rate (gph)	NSR	NO _x Reduction	Reduction per mole reagent
Before Tertiary Air	145	0.38	15.8%	41.6%
Before Tertiary Air	314.3	1.07	36.8%	34.4%

After Tertiary Air	282	0.72	28.9%	40.1%
After pre-calciner	180.5	0.54	21.4%	39.6%

These results suggest the relationship between the quantity of reagent and the NOx reduction. Notably, as increasing amounts of urea are injected, the resulting NOx reductions increase correspondingly. Examined in terms of NOx reduction per mole of ammonia equivalent injected, while some loss of efficiency is expected, the efficiency of urea utilization even at the highest urea injection rate is similar to the efficiency of urea utilization at the lowest urea injection rate. These results also suggest that the control efficiency is similar across several urea injection locations.

EPA believes that these tests demonstrate that SNCR at SMC-Charlevoix as it is currently configured can readily achieve at least 30 to 37 percent NOx reduction. As discussed above, EPA believes that use of ammonia would provide significantly greater control than was found in the tests at SMC-Charlevoix using urea. The tests, being short tests, by definition did not test the sustainability of control, but SMC provides no evidence that these short-term results could not also be achieved over longer periods. In addition to the change in reagent, SMC has a range of options for optimizing SNCR effectiveness and addressing the

potential operational issues arising from SNCR use. These include: use of facility design modifications that either reduce NOx emissions directly or facilitate use of SNCR or both; use of reagent injection both before and after the calciner; use of lime injection; adjustment of air flows; and other changes in operating characteristics. SMC in its written comments and in discussion during meetings with EPA did not address the option of using ammonia, either to dispute the feasibility of its use or to provide evidence regarding its effectiveness at SMC-Charlevoix. Since the tests at SMC-Charlevoix used urea and are not indicative of the NOx reduction that can be achieved using ammonia, the most pertinent evidence regarding potential effectiveness of SNCR using ammonia is the results of tests at SMC-Dixon, corroborated by results of tests at "Plant A" in the Horton paper and elsewhere. This evidence indicates that the 50 percent NOx emission reduction required at other cement plants is also achievable at SMC-Charlevoix.

The issues raised in SMC's comments suggest that SMC may need more than three years to explore the various alternatives for reducing NOx emissions at SMC-Charlevoix. Therefore, EPA is promulgating a compliance deadline for SMC that is extended by one year from the compliance deadline that EPA proposed, requiring compliance within approximately four years from the

date of this rulemaking.

In response to this comment, EPA also reevaluated the appropriate NOx limits. While EPA proposed a limit based on 50 percent control on average, effectively requiring 60 percent control when emission rates are at the 95th percentile level, EPA is promulgating a limit that will require only 50 percent control when emission rates are at the 95th percentile level.

EPA proposed a single limit, based on a 30-day average. Reconsidering the basis for determining the level of the limit, in particular considering a limit based on the 95th percentile emission level rather than based on the mean emission level, requires reconsidering the form of the standard. Whereas the proposed limit was intended to require a reasonable degree of control at all times, a 30-day average limit derived from 95th percentile emissions would allow substantially less emission reduction on other occasions. For example, at SMC-Charlevoix, a limit requiring 50 percent reduction from 95th percentile emissions would only require about 20 percent emission reduction at the 5th percentile emission level.

BART reflects controlling emissions at all times, not just on occasions with elevated emissions. For this reason, along with a 30-day average emission limit, EPA is also promulgating a limit on 12-month average emissions. In this pair of limits,

the 30-day average limit ensures that days with high baseline emissions are well controlled, and the 12-month average limit ensures that BART control is achieved on days with lower baseline emissions as well.

EPA used the most recent three years of emissions data available, from 2006 to 2008, to compute 30-day averages and 12-month averages. EPA is setting the 30-day average limit as a daily-rolling average limit, based on values recomputed every operating day to include the most recent 30 operating days, and EPA is setting the 12-month average as a block average, based on values recomputed at the end of each calendar month to include the preceding 12 calendar months. EPA used these averaging approaches to determine the distribution of 30-day and 12-month averages of NO_x emissions during the 2006 to 2008 period. The 95th percentiles among these sets of values (more precisely, 1.645 standard deviations above the means, calculated assuming a normal distribution) are a 30-day average of 5.6 lb per ton of clinker and a 12-month average of 4.7 lb per ton of clinker. EPA is setting limits based on a 50 percent reduction from these values, which with rounding equal a 30-day average limit of 2.80 lb per ton of clinker and a 12-month average limit of 2.40 lb per ton of clinker.

EPA had several reasons for selecting the 95th percentile of

baseline emissions as the starting point for determining the limits. First, use of the 95th percentile is an approach that EPA commonly uses in setting emission limits for similar sources in other contexts. For example, the consent decree for Lafarge Cement, which requires BART at Lafarge's Alpena facility, mandates control at the 95th percentile level. That is, this approach is responsive to SMC's concerns about EPA providing equity in its regulation of SMC and Lafarge. (Lafarge is also subject to both a 30-day average limit and a 12-month average limit.) Second, EPA considers the 95th percentile an appropriate compromise between setting the limit based on too low a percentile, which creates a higher percentage of time when the limit is more difficult to meet, and setting the limit based on too high a percentile, which too infrequently requires the company to achieve fully effective emission control. Third, EPA believes that the variability of the emission rates after control is likely to be less than the current variability. This is in part because the emission control can be operated in a manner that minimizes the difference in emission rates between the upper and the lower end of the distribution, in part because emissions control tends to be more effective when emission rates are higher, and in part because the limit will give the company incentive to use its knowledge about operating parameters that

influence emission rates to minimize emissions on occasions with higher emission rates. Fourth, since emission rates above the 95th percentile by definition rarely occur, any extra effort needed to achieve the limit on such occasions would rarely be needed.

SMC cites the limit for a Holcim plant in Montana as precedent for basing a limit on an upper point on the distribution, and yet SMC recommends basing the limit for SMC-Charlevoix on a more extreme statistic than was used for Holcim in Montana. EPA set the NOx limit for Holcim by assuming a 58 percent reduction from the 99th percentile of baseline emissions. In that case, EPA had limited information on emissions of the facility; in particular, EPA did not have information on 95th percentile emissions. SMC does not explain why it seeks the use of a more extreme statistic (supposedly the 99.7th percent, but in fact the 99.87th percentile), but the availability of more information allows EPA to use a more appropriate statistic (the 95th percentile) for SMC-Charlevoix.

Comment: SMC stated that "ammonia slip is a likely result of use of SNCR at Charlevoix." SMC quoted from EPA and the Portland Cement Association that use of SNCR under suboptimal conditions can result in unwanted ammonia emissions.

Response: SMC does not demonstrate that proper use of SNCR at

SMC-Charlevoix would cause ammonia slip at problematic levels. The photo of a detached plume at SMC-Charlevoix provided by SMC in its comments does not demonstrate that ammonia concentrations in the plume were high, and SMC does not provide information about operating conditions at the time of the picture to be able to judge this and other potential explanations of a detached plume at the facility. A theoretical comparison of urea input to NOx levels does not establish the presence or absence of ammonia slip, because such an approach fails to consider other factors reducing ammonia levels such as oxidation. In addition, for reasons discussed in the Horton paper cited above, describing the relative merits of using ammonia rather than urea, evidence that ammonia slip occurred during injection of urea does not necessarily indicate that ammonia slip would occur with a properly designed and operated SNCR using ammonia. While SMC would have to design an SNCR system carefully to avoid causing excess ammonia emissions, many other cement plants have successfully implemented SNCR without ammonia slip problems, and SMC has provided no evidence that this would be a challenge that cannot be solved at SMC-Charlevoix. As discussed above, EPA anticipates that SMC will conduct a variety of trials to assess the most effective NOx control program, and EPA anticipates that one of the parameters to be addressed in these trials is to

avoid emitting excess ammonia.

Comment: SMC stated that the "size of Charlevoix reduces its ability to control NOx using SNCR." SMC quoted an EPA report regarding NOx control at coal-fired electric utility boilers stating that "whereas smaller boilers may be able to achieve >60 percent NOx reduction, larger boilers may be capable of achieving reductions of only ~30 percent." SMC comments that a study of cement kilns also noted a "correlation between plant size and reduction efficiency." SMC provided a graph labeled "SNCR Test Results based on Capacity." SMC concludes that SMC-Charlevoix "should not be expected to have NOx reduction efficiencies of the smaller plants."

Response: SMC does not clarify its size in relation to the other facilities addressed in these studies. Since SMC-Charlevoix has lower heat input than many electric utility boilers, this comment would seem to suggest that SMC should be able to achieve the higher rather than the lower end of the range of utility boiler control efficiencies. The graph addressing cement plants that SMC provided is illegible, and so it is indeterminable from this graph how the size of SMC-Charlevoix compares to the size of other cement plants tested.

However, EPA also examined the size of SMC-Charlevoix relative to the size of cement plants that have been subject to

best available control technology determinations for new sources or major modifications in the last 6 years. These facilities have capacities quite similar to the capacity of SMC-Charlevoix. As seen in the EPA's RACT/BACT/LAER Clearinghouse, these facilities were typically issued permits that allowed 1.95 lb of NOx emissions per ton of clinker. Thus, even if smaller facilities are capable of even better NOx control, this evidence makes clear that the size of SMC-Charlevoix should not prevent SMC from achieving the level of control that EPA proposed to require.

Comment: SMC submitted several comments regarding the second factor to be considered in determining BART, namely the costs of compliance. The first of these comments reflected concerns about material buildup exacerbated by injection of urea and the costs that SMC would face in addressing that problem. SMC commented "Both SMC and EPA recognize that there are potential solutions [to this problem.] . . . The most effective solution is an extensive modification to the flash calciner including geometry changes to the process ductwork." SMC estimated that a new in-line calciner would cost \$18,000,000. SMC also discussed a second option in which SMC uses its existing kiln system configuration. In conjunction with criticism of EPA's cost estimates, SMC provided its own cost estimates for these two

options.

Response: EPA agrees that SMC has multiple options for implementing SNCR in a way that is both effective in reducing NOx emissions and workable in avoiding operational problems such as material buildup and ammonia slip. In addition to the option of a new in-line calciner and an option with the existing equipment using urea in the existing SNCR, other options include using ammonia with existing plant equipment and making other changes to improve flue gas chemistry. In addition to these four options, EPA believes that SMC has numerous variables that it can adjust and design features it can modify to maximize control efficiency and minimize NOx emissions.

Specifically concerning material buildup, the Horton paper cited above provides useful insights from comparison of SNCR use at various cement plants. The article observes that urea decomposes into carbon monoxide (CO) as well as ammonia, documents spikes in CO concentrations following urea injection, and evaluates the consequences of this CO. The article notes the propensity of the CO to consume hydroxyl radical that otherwise would help reduce nitric oxide to elemental nitrogen. The article concludes that urea is less effective in reducing NOx than ammonia at the temperatures found at SMC-Charlevoix. Further, CO from urea decomposition may well cause localized

reducing environments, potentially causing sulfur volatilization, which in turn could cause the buildup of sulfates that could form material buildup within the kiln system. That is, injecting urea may be more prone to cause buildup problems than injecting ammonia. Many other cement plants with similar SO₂ emissions have successfully operated SNCR without significant material buildup issues, and EPA believes that SMC too can find appropriate operational approaches (presumably involving use of ammonia as the NO_x reducing reagent) that will provide successful NO_x control without significant material buildup issues.

Comment: SMC commented that installation of a new in-line calciner would be a redesign of the facility that is not intended to satisfy BART. SMC quotes EPA's BART guidance: "We do not consider BART as a requirement to redesign the source when considering available control alternatives. For example, where the source subject to BART is a coal-fired electric generator, we do not require the BART analysis to consider building a natural gas-fired electric turbine"

Response: EPA is not requiring any particular kiln system design at SMC-Charlevoix, nor does EPA believe that the limit it proposed indirectly mandates any particular design. EPA is promulgating limits that EPA believes SMC can meet in several

ways. EPA is merely observing that replacement of the pre-calciner is one of several options SMC may choose to employ to meet the limits that EPA is promulgating.

SMC-Charlevoix currently has a pre-calciner, and so EPA does not view the modification of the facility to replace the existing pre-calciner with an improved pre-calciner, in conjunction with changes in air flow to reduce the likelihood of material buildup, as a "redesign" of the source. Indeed, unlike the example SMC cites, the replacement of the pre-calciner at SMC-Charlevoix would not change the fundamental design of the facility. Similarly, SMC may need to replace its SNCR system to meet EPA's limit, but EPA does not consider this to change the fundamental design of the facility either.⁴ Both before and after the modification, the facility would be described as a preheater/pre-calciner type Portland cement plant.

SMC, in evaluating how best to meet BART limits, may in fact decide that the replacement of its calciner and associated air flow changes, would be "the most effective solution" to "improve NOx control and address the buildup problem." Indeed, as discussed below, EPA developed cost estimates predicated on SMC installing both a replacement calciner and a new SNCR.

⁴ The existing SNCR was installed to provide an option to meet State limits on ozone-season NOx emissions. However, SMC asserts that it is able to meet the State limits without operating the SNCR, and EPA understands that SMC rarely if ever operates the SNCR, so that the SNCR has no significant effect on current emissions.

Nevertheless, as SMC implicitly concedes, other approaches may also suffice for effective operation with SNCR. Again, EPA expects that its proposed limit will require installation and operation of a SNCR system and some set of modifications to accommodate the system and maintain efficient and effective operation, but EPA does not believe that its proposed limit requires any fundamental redesign of SMC-Charlevoix.

Comment: SMC criticized EPA's estimated number of hours that heat input to the urea storage and handling system would be needed to assure that its urea would not crystallize, which SMC asserts would occur at 48° F. SMC objected to EPA's estimate that the "cooler season" includes 4000 hours requiring heating; SMC asserts that review of local meteorological data finds that "heat input would be required 6750 hours."

Response: EPA conducted its own analysis of Charlevoix meteorological data, available from the web site of the MDEQ. EPA's analysis considered actual heating needs each hour, reflecting the fact that an hour at 40° F, for example, would require less heating than an hour at 20° F. That is, EPA evaluated a heating degree hour metric, rather than SMC's simpler metric of the number of hours requiring heating.

EPA reviewed the most recent three years of data provided, i.e., 2008 to 2010. EPA examined the number of days below 50°

F. EPA's analysis assumed that SMC's envisioned 100 kW heating system would suffice down to -30° F, and that warmer days would require proportionately less electricity. This analysis found an average of 4900 hours per year below 50° F, and an average temperature among those hours of 31° F. That is, the average heating needs among those hours is to achieve a temperature 19° F above ambient temperature. At the company-estimated cost of \$0.0732 per kilowatt-hour of electricity, this translates to an estimated electricity cost of \$8,600 per year.

Comment: SMC commented on the expected lifetime of SMC-Charlevoix. "SMC maintains that the EPA air pollution cost control manual allows for a 10 year equipment life schedule and that this would more closely match SMC's short and long-term plans." Consequently, SMC implicitly recommended amortizing capital costs of control equipment over 10 years rather than 15 or 20 years.

Response: The EPA Air Pollution Control Cost Manual states at page 1-37, "an economic lifetime of 20 years is assumed for the SNCR system." A shorter amortization period would be appropriate only if SMC provided persuasive evidence that it will be shutting down its facility sooner. SMC has provided no such evidence. In particular, SMC does not appear to be subject to any enforceable orders to shut down within that period, nor

has SMC expressed a desire to become subject to such an order. To the contrary, SMC has been investing in emission control and applied for a permit for other plant improvements (though SMC cancelled the project), suggesting that SMC expects its Charlevoix facility to be operating well more than 10 years into the future. Therefore, the most appropriate amortization period for capital costs of SNCR at SMC-Charlevoix is 20 years.

Comment: SMC objected to EPA's urea cost estimates. SMC conceded that \$450 is the cost per ton of (undiluted) urea at the Gulf of Mexico, but SMC provided a vendor quote to indicate a price per gallon in Michigan, equivalent to \$814 per ton of actual urea (\$366/ton of 45 percent solution).

Response: EPA asked the Institute of Clean Air Companies about urea prices and received a reply from a representative of Fuel Tech, Inc., a urea supplier. Fuel Tech replied that companies have the option to purchase pure, dry urea, at a price of \$400 to \$500 per ton, which the company could mix with water (using purchased mixing equipment) before use, but companies normally purchase 50 percent urea from a supplier. Fuel Tech quoted a price range for 50 percent urea solution in Central Michigan of \$1.60 to \$1.80 per gallon. The upper end of this range equates to about \$758 per ton of urea. EPA has adjusted its urea-based cost estimates (discussed below) to use this urea cost.

However, use of ammonia is cheaper and more effective, so the cost of urea was not a significant factor in EPA's evaluation of the cost effectiveness of SNCR.

Comment: As noted above, SMC provided cost-effectiveness estimates for an option that may be labeled a "replacement pre-calciner" option and for an option that may be labeled an "existing equipment" option. These estimates were that NOx emission reduction would cost \$6,767 and \$6,249 per ton, respectively, which SMC considers too expensive to be found to be BART.

Response: SMC's estimates include a number of elements that SMC includes without comment that nevertheless warrant review. SMC's cost estimates include a number of ancillary costs ostensibly related to installation of a purchased SNCR, including instrumentation, freight, foundations and supports, handling and erection, electrical equipment, piping, insulation, painting, engineering, construction and field expenses, contractor fees, start-up costs, performance test costs, and contingencies. These cost estimates are substantial, adding up to more than 150 percent of the purchased equipment cost, i.e. yielding a total capital cost that is more than two and a half times the cost of the equipment itself.

While SMC cites the EPA Air Pollution Control Cost Manual

as the basis for these cost estimates, SMC used an inappropriate method from this manual. The EPA Air Pollution Control Cost Manual recommends different cost estimation approaches for different types of control devices, and SMC appears to have used the approach recommended for estimating costs of gas absorbers⁵ rather than the approach recommended for SNCR. The approach recommended in the EPA Air Pollution Control Cost Manual for estimating costs of SNCR does not include all the costs listed above for gas absorbers. Instead, the Control Cost Manual recommends assuming only the following costs: a general facilities cost (5 percent of SNCR purchase cost), engineering and home office fees (10 percent), process contingency cost (5 percent), project contingency (15 percent of installed cost), pre-production cost (2 percent of total plant cost), and inventory cost (cost of two weeks of reagent). These costs are estimated to add about 42 percent to the purchase cost of the SNCR. Thus, the cost estimation approach used by SMC significantly overestimates SNCR installation costs.

In using the cost estimation approach recommended for gas absorbers rather than the approach recommended for SNCR, SMC has also overestimated the annual cost of operating SNCR. Most

⁵ SMC's approach also resembles the approach recommended for several other control devices. Nevertheless, for simplicity, SMC's approach may be labeled the gas absorber approach.

significantly, as EPA noted in its proposed rulemaking notice, EPA recommends assuming that overhead for operating SNCR is negligible, unlike the 60 percent of labor and materials that the Control Cost Manual recommends for gas absorbers.

Similarly, the Control Cost Manual recommends assuming administrative charges and insurance for SNCR (unlike for gas absorbers) are also negligible. This results in a significant difference in cost estimates: for the replacement pre-calciner option, for example, SMC estimates the sum of overhead, administrative charges, and insurance to be \$4,397,697, whereas EPA finds these costs to be negligible.

In addition, SMC inappropriately assumes that the multipliers used to estimate ancillary costs associated with installation of emission control systems based on emission control equipment purchase costs may also be applied to modifications of SMC's kiln system such as replacement of its pre-calciner. SMC provides no justification for applying these SNCR-related multipliers to the cost of a replacement pre-calciner, and EPA believes that installation of a replacement pre-calciner would not require such costs.

In many respects, the cost estimates EPA provided in its notice of proposed rulemaking also mistakenly used the gas absorber approach to estimate costs. Thus, EPA's proposed rule

also substantially overestimated the costs of SNCR. An exception concerns overhead costs: the gas absorber approach recommends significant costs, but the notice of proposed rulemaking observed that the SNCR approach in the EPA Air Pollution Control Cost Manual recommends assuming that overhead costs are negligible. (SMC neglected this observation and continued in its comments to estimate substantial, unjustified overhead costs.)

For this final rule, the primary basis of EPA's views on the cost effectiveness of SNCR at SMC-Charlevoix are revised cost estimates derived according to the approach recommended in the EPA Air Pollution Control Cost Manual for estimating costs of SNCR. Nevertheless, EPA for this final rule also prepared cost estimates using an approach that was similar to the approach used in its proposed rule. This approach resembled the gas absorber approach, except that the approach assumed negligible overhead costs, which the notice of proposed rulemaking observed is the recommended assumption for SNCR. These estimates assumed the use of ammonia as the reagent, based on information indicating that urea is a less effective reagent. While EPA believes this approach overstates likely costs, insofar as it includes significant estimated installation costs that should not be assumed to apply to SNCR installations, these

cost estimates nevertheless provide further perspective on the likely cost effectiveness of SNCR at SMC-Charlevoix.

SMC is currently equipped with an SNCR system. SMC nevertheless includes the cost of new SNCR equipment (estimated as \$1,371,630) in all of its cost estimates. SMC did not explain why it would be unable to use the existing equipment, except to say that \$400,000 of the costs would provide for winter storage of reagent. One possibility is that the remaining \$971,630 would be necessary to purchase a system that works more effectively than the system that is currently installed. Another possibility is that SMC will incur no such expense. EPA has evaluated cost effectiveness for both possibilities, to assess the range of cost effectiveness according to whether replacement SNCR equipment is necessary.

A significant factor affecting the cost of SNCR is the quantity of reagent needed to achieve the expected emission reduction. The BART review that SMC provided to Michigan assumed that 180 gallons per hour of 40 percent urea solution, costing \$1.06 per gallon, would be used for 8000 hours and would reduce NO_x emissions by 524 tons per year. Assuming 9.5 lb per gallon of urea solution, this translates to an estimate that

182,400 pound-moles of ammonia-equivalent⁶ would be needed to achieve a reduction of 22,800 pound-moles of NOx, i.e., that each mole of ammonia-equivalent achieves only 0.125 moles of NOx reduction. This efficiency is less than one third of the efficiency shown in the DeNOx Technology trials discussed above.

For all of its reagent cost estimates, EPA estimated reagent usage according to the targeted NOx reduction and the expected amount of reagent needed per mole of NOx reduction. EPA's expected NOx reduction for both the replacement calciner option and the existing system option differs substantially from SMC's values. SMC apparently used a peak allowable baseline (pre-control) NOx emission rate (5,741 tons per year), whereas EPA used a 2006 to 2008 average actual baseline rate (2,518 tons per year).

Based on comments regarding inefficient control at SMC-Charlevoix using urea, most of EPA's cost effectiveness estimates were based on the use of ammonia, though a few estimates were based on the use of urea. As discussed above, EPA assumed a urea cost of \$758 per ton of urea. Based on information provided by Fuel Tech, EPA assumed an ammonia cost of \$600 per ton.

⁶ The molecular weight of urea is 60. Each molecule of urea yields two molecules of ammonia. Therefore, 30 pounds of urea yields one pound-mole of ammonia. That is, 30 pounds of urea is one pound-mole of ammonia equivalent.

EPA then estimated reagent usage according to various estimates of the quantity of NOx reduced per mole of injected or created ammonia. One of these estimates used the results of the tests conducted at SMC-Dixon, in which injection of reagent at an NSR of 0.62 sufficed to reduce NOx emissions by 50 percent. These results suggest the need for greater use of reagent than is indicated in test results at "Plant A" in the Horton paper, which indicates on average that the NOx reduction is 92 percent of the amount of ammonia injection, so that an NSR of 0.54 would suffice to reduce NOx emissions by 50 percent. Another estimate used the average of the tests at SMC-Charlevoix using urea, i.e., that the number of moles of NOx reduced is 40 percent of the number of moles of ammonia that the injected urea creates.

Table 2 shows cost effectiveness estimates for an option in which SMC uses largely its existing configuration and injects ammonia. This option is assumed at most to have only minor modifications, except for installation of a replacement SNCR system and except for installation of ammonia storage equipment, which is assumed to have the same cost as SMC's estimate for urea winter storage equipment. This table assumes the effectiveness of ammonia found at SMC-Dixon. This table assumes that sufficient ammonia is added to achieve a 12-month average limit of 2.40 lb per ton of clinker (the limit in the final

FIP), which is estimated on average to require a 47 percent emission reduction, a reduction from baseline NOx emission levels of 1182 tons per year.

Table 2. Cost Effectiveness using ammonia with existing configuration (with replacement of the SNCR system)

Capital costs		Cost	Notes
SNCR		\$1,371,630	Includes winterizing cost
General facilities	5%	\$68,582	
Engineering	10%	\$137,163	
Process contingency	5%	\$68,582	
Project contingency	15%	\$246,893	
Subtotal SNCR		\$1,892,849	
Preproduction	2%	\$37,857	
Ammonia inventory		\$12,465	2 weeks inventory
Total Capital cost		\$1,943,171	
Annual costs			
Ammonia		\$324,970	
Maintenance	1.5%	\$28,393	
Electricity		\$8,600	
Power loss		\$16,427	
Total direct Annual		\$378,389	
Capital recovery		\$183,435	Amortizes over 20 years
Total		\$561,825	
Cost per ton		\$475	Reduction is 1182 tons/yr

This cost effectiveness estimate in Table 2 assumes that SMC will need to replace its existing SNCR. Alternatively, EPA estimated cost effectiveness for the possibility that SMC will be able to use its existing SNCR. This evaluation assumed the same estimate of ancillary costs (e.g., general facilities costs, engineering, and contingency costs) as are shown in Table 2 but assumed that the equipment purchase cost would only be \$400,000 for a reagent winter storage system. This resulted in

a cost effectiveness estimate of \$398 per ton of NO_x, somewhat below the \$475 per ton of NO_x estimated assuming the need for a replacement SNCR.

Although EPA, consistent with the Horton paper, believes that ammonia would be considerably more efficient at reducing NO_x than urea, EPA also estimated ammonia costs assuming that SMC achieved the same efficiency with ammonia as it achieved with urea. Specifically, these cost estimates assumed that each mole of ammonia reduced 0.4 moles of NO_x. To achieve a reduction of 1182 tons per year, this resulted in an estimate that ammonia costs would be \$655,181, leading to a total annualized cost of \$893,032, or \$756 per ton of NO_x reduced.

These estimates reflect considerably less expense for using ammonia than for using urea. This is partly because ammonia is likely to be more effective, but this is also because ammonia is somewhat cheaper per ton and because the ammonia content of a ton of ammonia is almost twice the amount of ammonia yielded by a ton of urea. For the plant as currently configured, EPA did not estimate costs using urea.

A second set of scenarios EPA evaluated reflect an option noted by SMC involving replacing the pre-calciner, which would provide conditions more suitable for use of urea for reducing NO_x emissions. SMC estimated that this replacement would cost

\$18,000,000. Although SMC does not document the basis for this estimate, EPA nevertheless used SMC's estimate of this cost.

EPA viewed this as an estimate of total installed cost.

Therefore, EPA believes that the typical approach in the EPA Air Pollution Control Cost Manual, starting with the cost of purchasing control equipment and adding multipliers to account for various installation costs, would double count these installation costs.

Arguably, much of the cost of replacing the pre-calciner at SMC-Charlevoix would be offset by savings to the company through more efficient operation and ability to use cheaper fuels.

Indeed, the fact that SMC applied for and received a permit to replace its pre-calciner but then cancelled the permit suggests that the company believed that this replacement would have had benefits that mostly but not entirely would have offset the costs of its implementation. To address this issue, EPA evaluated cost effectiveness both for a scenario in which none of the costs of a replacement pre-calciner are offset and for a scenario in which all of the costs are offset, in order to evaluate the range of cost effectiveness estimates according to the range of possible degrees to which the costs of a replacement pre-calciner would be offset by economic benefits to SMC. EPA estimated costs both for the use of ammonia and for

the use of urea. EPA agrees with SMC's view that a redesigned pre-calciner would address the issues that SMC asserts make urea usage problematic under the current plant design, and so EPA's cost estimates for this option assumed that NOx removal efficiency under this option would match that found at SMC-Dixon.

The resulting estimates were that the option using a replaced pre-calciner, with no cost offset, would cost \$2,252 per ton of NOx removed using urea and \$1,901 per ton using ammonia. With a full cost offset, using urea as the reagent, the cost was estimated to be \$815 per ton of NOx removed. The derivation of these estimates is shown in more detail in a technical support document for this rulemaking.

SMC's comments indicate that the replacement calciner will improve the efficiency of SMC-Charlevoix and reduce the baseline NOx emission rate to 3.9 lb per ton of clinker. This suggests that achievement of a limit of 2.4 lb per ton of clinker on average would require about a 40 percent NOx emission reduction rather than about a 50 percent reduction, requiring correspondingly less reagent. EPA estimated reagent costs accordingly, yielding an estimate of \$1,835 per ton of NOx removed using ammonia as the reagent.

As discussed above, EPA believes that SMC has a variety of

options for meeting the limits EPA is promulgating. Thus, EPA prepared additional cost estimates reflecting other scenarios that may be associated with achievement of the limits EPA is promulgating. One scenario involves various physical changes to the plant to facilitate use of SNCR, such as straightening flows to minimize the likelihood of problems from material buildup. EPA's proposed rulemaking reflected consideration of such an option, and SMC's comments include cost estimates for such an option as well. EPA and SMC assumed that these physical changes would require a capital expenditure equal to half the cost of the SNCR plus the urea winter storage system. (SMC commented that this cost estimate was unjustified, but SMC used this estimate nevertheless, and EPA believes that this cost estimate provides a useful indication of whether control options that involve varying degrees of plant modifications would be cost effective.) As proposed by SMC, the cost estimates for this scenario also assumed that the use of SNCR would result in the need for two additional days of shutdown to address material buildup, costing SMC \$387,200 of production. As noted above, EPA believes that SMC can implement SNCR at SMC-Charlevoix without significant material buildup or production loss, particularly if it uses ammonia as the reagent, to achieve the successful SNCR operation that other companies have achieved.

However, EPA prepared this estimate to assess whether such production loss would significantly alter the cost effectiveness of SNCR use. Finally, while this scenario could involve use of either urea or ammonia, EPA estimated costs for this scenario using ammonia because available evidence suggests that the promulgated emission limits are most likely to be met using ammonia. To obtain conservative cost estimates, EPA assumed the NO_x removal efficiency found in the DeNO_x Technologies tests at SMC-Charlevoix, even though EPA expects SMC to be able to achieve better efficiency through use of ammonia. As discussed in the technical support document, EPA estimated that this scenario would cost \$1,138 per ton of NO_x removed.

Another scenario EPA examined involved lime injection. Material buildup is a function of the chemistry of the gases within the kiln system, and one option for addressing material buildup may be to inject lime at an appropriate point to minimize the sulfur concentration in the gases, to reduce the potential for sulfate formation. SMC has provided material to EPA suggesting that it already operates a bypass system to achieve this purpose. Nevertheless, EPA believes that it may be helpful to supplement this bypass system with lime injection, and in any case the costs for a scenario involving lime injection may be viewed as a representation of likely costs for

a broad range of options (including, for example, the use of additional excess air) that may be warranted for optimizing gas chemistry to optimize SNCR effectiveness. This scenario involved capital costs of \$300,000 to install a lime injection system and an annual cost of \$300,000 for lime. (To the extent that SMC could use lime it produces itself without loss of production, the annual cost could be considerably lower.) Again, to obtain conservative cost estimates, EPA made these estimates assuming the NOx reduction efficiency found in the DeNOx Technologies tests, even though EPA anticipates that SMC will be able to obtain better efficiency. The resulting estimate, based on the use of ammonia, was that annualized costs would be \$1,034 per ton of NOx removed.

In discussions between SMC and EPA, SMC raised the possibility that it could achieve 10 percent reduction of NOx emissions through facility modifications and operational changes. These might include mid-kiln firing, other burner changes, water suppression, tire firing, and other changes that might reduce NOx formation. EPA did not attempt to estimate the costs of these approaches. Nevertheless, these approaches constitute additional options that SMC has to achieve the limits that EPA is promulgating. Some of these approaches may well be cheaper for SMC to implement than SNCR, in which case the use of

the approaches would allow SMC to reduce NOx more cost effectively.

As noted above, the cost effectiveness estimates underlying EPA's proposed rulemaking in most respects reflected the method recommended in the EPA Air Pollution Control Cost Manual for estimating costs of gas absorbers. The technical support document describes two cost estimates using this method, reflecting the efficiency found at SMC-Dixon and the efficiency found using urea at SMC-Charlevoix, respectively. Both cost estimates amortize capital costs over 20 years, both use ammonia as the reagent, and both assume that new SNCR equipment will be needed. These resulting cost effectiveness estimates were \$720 and \$999 per ton of NOx removed, respectively. Thus, using the gas absorber method, like using the more appropriate SNCR method, leads to the conclusion that control using SNCR is cost effective.

Comment: SMC stated, "The economic impact of EPA's proposed NOx limit would be devastating to northern Michigan." SMC cited statistics regarding the employment and taxes paid by SMC-Charlevoix. SMC commented on the fragile economy. "In particular, the cement industry has been hit hard." SMC noted that it "was forced to shift production from its Dixon, Illinois facility to Charlevoix . . . to make a return on its

investment." SMC raised the possibility of SMC suspending or ceasing operations in Charlevoix, and comments on the devastating effect this would have on the northern Michigan economy.

Response: EPA has thoroughly considered the expected costs of several available options for controlling NOx at SMC, evaluating SMC's estimates and information we gathered from vendors and analyses performed for other comparable facilities. SMC has not justified a statement that implementing a set of controls that many other facilities are currently implementing, and incurring the costs to do so, would make SMC-Charlevoix unprofitable to operate or otherwise cause SMC to suspend or cease operations. EPA believes further that the costs of control would be considerably lower than SMC estimates. EPA does not believe that meeting the BART limits in the FIP would lead to the shutdown of SMC-Charlevoix.

Comment: SMC cited a third factor in determining BART, namely the energy and non-air quality environmental impacts of compliance. SMC commented that addition of urea would cause ammonia slip.

Response: As stated above, SMC has not demonstrated that ammonia slip would be a problem at SMC-Charlevoix. Numerous cement plants are successfully operating SNCR in a manner that

does not cause significant ammonia slip, and EPA believes that SMC would be able to operate SMC-Charlevoix in a manner that avoids significant ammonia slip as well.

Comment: SMC cited a fourth factor in determining BART, namely any pollution control equipment in use or in existence at the source. SMC noted that it has "purchased and installed a state of the art fabric filter baghouse and has installed an Indirect Fire system which includes low NOx burners."

Response: EPA recognizes the presence of these control systems. Indeed, the indirect fire system facilitates the achievement of lower NOx emissions, and EPA believes that this system in combination with SNCR is necessary to achieve the BART emission limit that EPA proposed. Given the availability and costs effectiveness of additional NOx controls, however, these existing controls alone do not meet the BART requirement.

Comment: SMC cited a fifth factor in determining BART, namely the remaining useful life of the source. SMC repeated its statement, addressed above, that the EPA Control Cost Manual allows for 10 year equipment life schedules which more closely match SMC's short- and long-term plans.

Response: EPA has addressed this comment above. The consolidation of cement production at SMC-Charlevoix, mentioned in SMC's comments, further suggests that SMC-Charlevoix is

unlikely to be shut down in 10 years.

Comment: SMC commented, "EPA is not empowered to substitute its judgment for that of the State of Michigan as to the appropriate BART limit."

Response: The Clean Air Act gives EPA the authority and responsibility to determine whether Michigan has met the applicable requirements. In selected circumstances, such as apply here, if the state plan does not meet the requirements, the Clean Air Act does empower EPA to promulgate limits in lieu of those proposed by the state. Further discussion of this topic is provided in response to a similar comment by Michigan. As noted above, however, EPA prefers SIPs to FIPs, and will work with Michigan if it wants to submit a SIP to replace the FIP.

Comment: SMC cited a sixth factor in determining BART, namely the degree of improvement in visibility that a control option would yield. SMC did not dispute EPA's estimate of the benefit of SNCR but argues that a reduction of permitted emission levels would yield greater visibility benefits.

SMC "proposes to reduce its permitted emission levels to meet a 30-day rolling average limit for NO_x of 4.85 [lb per ton, which] represents a 25 percent reduction in potential NO_x emissions." SMC also "proposes that it meet a 30-day rolling average limit for SO₂ of 7.5 [lb per ton, which] represents a 16

percent reduction in potential SO₂ emissions." Finally, "SMC proposes a cap on its clinker production," representing "a 9.4 percent reduction from its current maximum."

SMC conducted CALPUFF modeling to assess the visibility improvement associated with its proposed reduction in permitted emissions. "The results show an improvement of 1.6 dv at Seney, which is significantly better than the 0.4 dv improvement EPA projected would be achieved with its proposed NO_x limit."

Response: SMC proposes a reduction in permitted emissions, but its proposed limits would only require minimal actual emission reductions. According to emissions data for 2006 to 2008, which is the most recent detailed data that SMC has provided to EPA, most 30-day average emission levels are well below SMC's proposed limit. For the occasions in 2006 to 2008 in which the 30-day averages exceeded 4.85 lb per ton of clinker, the emission reductions that would have been needed to meet this limit are only about 3 percent of annual total emissions. EPA's proposed SO₂ limit, which SMC proposes to apply on a 30-day average basis, expressly requires no actual emission reductions. SMC's proposed production cap is well above 2006 to 2008 production levels, and thus also would require no actual emission reductions.

In contrast, EPA proposed a limit that would require

approximately a 50 percent reduction in actual NOx emissions. EPA's assessment of the visibility benefits of BART was based on projected actual emission reductions. A comparable analysis of SMC's proposal would find no reductions and thus no benefits for the SO₂ limit or the production cap. SMC's proposal is estimated to require about a 3 percent NOx emission reduction, compared to EPA's approximately 50 percent, and so an assessment using EPA's methodology would likely estimate a real visibility benefit of about 0.02 dv.

SMC does not explain why its proposal, which clearly requires less emission reduction than EPA's proposal, nevertheless would show significantly more visibility benefit. While SMC does not provide sufficient information about its modeling to make a complete comparison, the disparity reflects significant differences between the two benefit assessments, in particular including the fact that SMC compared its suggested limits to current allowable emissions, whereas EPA assessed the benefits of actual emission reductions that would be expected with imposition of EPA's proposed limits.

Cliffs

Comment: Cliffs objected to EPA addressing Tilden Mining in a separate rulemaking focused on Michigan and Minnesota taconite facilities (August 15, 2012 rulemaking) rather than in the

rulemaking addressing most of the rest of Michigan's plan. Cliffs commented "EPA fails to provide an adequate basis for regulating Tilden separately." Cliffs acknowledged that EPA stated that this approach was "to ensure that the Tilden Mining taconite plant and similar facilities in Minnesota are subject to similar requirements." However, Cliffs objected that EPA provided neither factual data nor explanation of its legal interpretations in support of this approach. Furthermore, Cliffs objected to EPA's rationale for rulemaking on Tilden Mining in conjunction with rulemaking on other taconite plants, arguing that the Regional Haze Rule requires case-by-case BART determinations.

Response: The Clean Air Act requires that EPA complete rulemaking on Michigan's submittal but does not limit EPA's flexibility in choosing to conduct rulemakings on selected elements of the State's submittal, potentially in combination with similar elements of other states' submittals, even simply for EPA's administrative convenience. Cliffs provides no rationale to the contrary. Moreover, Cliffs identifies no basis for concluding that rulemaking on Tilden Mining along with the Minnesota taconite plants could be expected to yield an inappropriate conclusion regarding Tilden Mining or is otherwise harmful to Cliffs' interests. EPA believes that case-by-case

review of sources should reach similar conclusions for similar facilities, but EPA need not find Tilden Mining similar to Cliffs' other taconite facilities to have the discretion to conduct rulemaking on all of the taconite facilities together.

Comment: Cliffs stated, "EPA does not give Michigan's [BART] determinations the requisite deference." Further, "EPA can only disapprove a SIP where it fails to meet minimum Clean Air Act requirements." Cliffs noted its intent to identify its detailed concerns regarding BART for Tilden Mining in comments addressing the August 15, 2012, rulemaking that in fact prompts these concerns. Nevertheless, Cliffs commented that "EPA improperly tries to substitute its own judgment for Michigan's."

Response: EPA has not tried in this rulemaking to "substitute its own judgment for Michigan's" with respect to Cliff's facility, because EPA is taking no action with respect to this facility in this rulemaking. More generally, this proposal was promulgated more than three years after EPA published a notice in which EPA found that Michigan failed to submit the required regional haze SIP. (74 FR 2392, January 15, 2009) In the absence of an adequate state submittal, more than two years after this finding, the Clean Air Act mandates that EPA promulgate a federal plan. See *Clean Air Act section 110(c)*. A more detailed response is provided in response to a similar

comment by Michigan. To the extent that Cliffs' comment pertains to EPA's proposal on the separate rulemaking that promulgates federal limits for taconite plants including the Tilden Mining facility, this comment is not germane to this rulemaking.

Comment: Cliffs requested that EPA hold "the public hearing proposed for September 19, 2012. That hearing must be broad enough to address both comments on this Proposed Rule and concerns associated with EPA's related determinations for the Tilden taconite facility." Cliffs commented that a hearing with this alternate purpose "is necessary . . . to allow local parties [in Michigan] to provide feedback on the proposed Tilden implementation plan."

Response: By letter dated September 14, 2012, EPA denied Cliffs' request because it related to matters addressed in the separate proposed rulemaking published August 15, 2012. Under Clean Air Act section 307(d), EPA must offer interested parties the opportunity for oral presentation of their comments on a proposed FIP but need not offer such opportunity for comments relevant to reviews of state plans, such as the proposed partial approval and partial disapproval of the Michigan SIP. Cliffs requested that EPA hold a public hearing in Michigan, but Cliffs urged that this hearing be held to provide Cliffs opportunity to

provide extensive comments regarding Tilden Mining. Cliffs expressed no intent to comment on the proposed FIP elements for BART for SMC or Escanaba Paper. That is, Cliffs in its request did not demonstrate that it was an interested party with respect to the proposed federal limits for SMC or Escanaba Paper.

Implicit in EPA's proposed rulemaking was that EPA was offering to hold a public hearing for purposes of receiving oral comments on its proposed federal limits for SMC and Escanaba Paper. This purpose was clarified in EPA's letter to Cliffs and in EPA's web site announcing terms of the potential hearing, which stated, "EPA is providing the public the opportunity to request a public hearing regarding its proposal to establish emission limits for two facilities in Michigan: St. Mary's Cement facility in Charlevoix, and NewPage Paper in Escanaba."

Finally, Cliffs has had multiple opportunities to provide oral comments on EPA's proposed actions regarding Tilden Mining and Cliffs' other taconite facilities and on any other issues Cliffs may have wished to address. These opportunities included a public hearing on August 29, 2012, in St. Paul, Minnesota (at which a Cliffs representative testified) and multiple meetings with EPA.

III. What are EPA's Final BART Determinations?

As noted above, in absence of a state submittal that satisfies the BART requirements for SMC-Charlevoix and for Escanaba Paper's Escanaba facility, EPA is under an obligation to promulgate a FIP satisfying these requirements. The following summary reflects EPA's final evaluation of appropriate limits that satisfy the BART requirement for these facilities. As noted above, EPA is addressing Tilden Mining's facility near Ishpeming in a separate rulemaking.

A. SMC

EPA proposed to determine that BART for SMC-Charlevoix includes operation of SNCR achieving an average of 50 percent reduction of NO_x emissions. EPA continues to believe that BART for this facility includes operation of SNCR. SMC provided results of tests using urea showing achievement of only 30 to 37 percent reduction of NO_x, which SMC believes reflect conditions that yield suboptimal results for use of urea. Available evidence suggests that use of ammonia is likely to be considerably more effective at SMC-Charlevoix, and in fact most cement plants using SNCR use ammonia as the NO_x control reagent. EPA finds this control to be cost effective, and a review of relevant factors supports the conclusion that effective implementation of SNCR is BART for this facility. EPA continues

to believe that a requirement for 50 percent reduction in NO_x emissions is warranted.

However, the proposed limit would have required approximately 60 percent NO_x reduction on occasions when the emission rates equaled the 95th percentile of baseline emission rates. In response to comments, EPA is promulgating a limit that requires 50 percent control of such emissions, in order to provide increased confidence that the limit can be met. To limit peak emissions, EPA is promulgating a limit based on the rolling average emissions of 30 consecutive operating days. In addition, to ensure BART level control on days with typical emissions as well as on days with elevated emissions, EPA is also promulgating a limit on 12-month average emissions. These limits are 2.8 lb of NO_x per ton of clinker and 2.4 lb of NO_x per ton of clinker, respectively. EPA is requiring that SMC comply with these limits by January 1, 2017, such that the averaging periods beginning on January 1, 2017, are the first periods for which emissions must be at or below the required level. This provides a four year period for compliance instead of three years as proposed, because EPA believes that four years represents the most expeditious schedule for SMC to install appropriate controls to meet the limit.

EPA proposed to limit SO₂ emissions at SMC-Charlevoix to 7.5 lbs per ton of clinker, based on a view that add-on control is not warranted under current circumstances but would be warranted if higher sulfur feed materials were used. EPA's proposed rule cited estimated costs of \$3,500 and \$4,500 per ton of SO₂ removed (estimated for emissions at permitted levels), but this proposal reflected consideration of a variety of factors that needed to be considered in assessing BART at SMC-Charlevoix, including the fact that at normal emission rates for this facility, costs per ton of SO₂ removed would be much higher. EPA is promulgating its proposed SO₂ emission limit.

B. Escanaba Paper

In its proposed rulemaking, EPA proposed to determine that BART for boilers 8 and 9 at Escanaba Paper's Escanaba facility included combustion control as a means of reducing NO_x emissions. The notice of proposed rulemaking provides detailed discussion of particular control options and the cost effectiveness of these options. The notice of proposed rulemaking further observed that Escanaba Paper has already implemented improvements in its combustion control, such that EPA proposed to establish limits that merely mandated that Escanaba continue to maintain the current level of NO_x emission control.

No commenters objected to this proposed BART determination, and EPA has no reason to change its views regarding BART for Escanaba Paper. As discussed above, EPA received various comments from Escanaba Paper regarding the emission limits that are to be established to require BART and the test method, recordkeeping, and reporting requirements that are to be established. Pursuant to these comments, EPA is promulgating a modified form of the limit for Boiler Number 8, based on a fixed limit of 0.35 lb of NO_x per MMBTU, rather than limit emissions based on the weighted average of separate limits for emissions from oil firing and for emissions from gas firing. The limits for Boilers Number 8 and Number 9 are effective immediately upon the effective date of this rule, as proposed. As discussed above, EPA is also modifying assorted elements of the test methods, recordkeeping, and reporting requirements that will apply to Escanaba Paper.

IV. What Actions is EPA Taking?

EPA is finalizing approval of elements of Michigan's SIP submittal, submitted on November 5, 2010, addressing regional haze for the first implementation period. The submittal was intended to satisfy Clean Air Act and Regional Haze Rule requirements for states to remedy any existing anthropogenic and prevent future impairment of visibility at Class I areas.

EPA finds that Michigan's submission satisfies BART requirements for some of the non-EGUs, based in part on existing SIP emission limits and most notably based on a Federal consent decree requiring new controls for SO₂ and NO_x emissions for the Lafarge plant. On the other hand, EPA is finalizing disapproval of the NO_x and SO₂ BART determination for the cement kiln and associated equipment at SMC-Charlevoix and of the NO_x BART determination for boilers Number 8 and Number 9 at Escanaba Paper. Further, EPA is promulgating a FIP that imposes NO_x and SO₂ limits mandating BART for the cement kiln and associated equipment for the SMC-Charlevoix and NO_x limits mandating BART for boilers Numbers 8 and 9 at Escanaba Paper.

EPA is not addressing Michigan's BART determination for Tilden Mining taconite plant in this action. EPA has proposed separate action and plans separate final action regarding this facility in separate rulemaking action that also addresses taconite facilities in Minnesota.

Michigan's submission provides an approvable analysis of the emission reductions needed to satisfy reasonable progress and other regional haze planning requirements. Michigan's submittal includes a long-term strategy that provides for reasonable progress except to the extent that the deficiencies with respect to BART for SMC and Escanaba Paper (and, according

to a separate proposed rule, Tilden Mining) constitute shortfalls in the set of measures needed to provide reasonable progress. EPA is approving Michigan's submittal as meeting other regional haze planning requirements including identification of affected Class I areas, provision of a monitoring plan, and consultation with other parties.

V. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action will promulgate requirements for two facilities and is therefore not a rule of general applicability. This type of action is exempt from review under Executive Orders 12866 (58 FR 51735, October 4, 1993) and 13563 (76 FR 3821, January 21, 2011).

B. Paperwork Reduction Act

This action does not impose an information collection burden under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. Burden is defined at 5 CFR 1320.3(b). Because this FIP only applies to two facilities, the Paperwork Reduction Act does not apply.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an

agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) a small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this action on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. The net result of this FIP action is that EPA is promulgating emission controls on selected units at only two facilities. The facilities in question are a large cement plant and a large paper mill that are not owned by small entities, and

therefore are not small entities.

D. Unfunded Mandates Reform Act (UMRA)

This rule does not contain a Federal mandate that may result in expenditures of \$100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. It is a rule of particular applicability that affects only two facilities in Michigan. Thus, this rule is not subject to the requirements of sections 202 or 205 of UMRA.

This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. This rule only applies to two facilities in Michigan.

E. Executive Order 13132 Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. This action addresses Michigan not meeting its obligation to adopt a SIP that meets the regional haze requirements under the Clean Air Act. Thus, Executive Order 13132 does not apply to this action. Although section 6 of

Executive Order 13132 does not apply to this action, EPA did consult with Michigan in developing this action.

F. Executive Order 13175

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000), because the action EPA is taking neither imposes substantial direct compliance costs on tribal governments, nor preempts tribal law. It will not have substantial direct effects on tribal government. Thus, Executive Order 13175 does not apply to this action. However, to the extent this rule will limit emissions, the rule will have a beneficial effect on tribal health by reducing air pollution.

G. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks

EPA interprets EO 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5-501 of the EO has the potential to influence the regulation. This action is not subject to EO 13045 because it implements specific standards established by Congress in statutes. However, to the extent this rule will limit emissions, the rule will have a beneficial effect on children's health by reducing air pollution.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not subject to Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law No. 104-113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This action does not involve technical standards. Today's action does not require the public to perform activities conducive to the use of voluntary consensus standards. Therefore, EPA did not consider the use of any voluntary consensus standards.

J. Executive Order 12898: Federal Actions to Address

Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, February 16, 1994), establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

We have determined that this rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. This rule limits emissions from two facilities.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the

agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. Section 804 exempts from section 801 the following types of rules (1) rules of particular applicability; (2) rules relating to agency management or personnel; and (3) rules of agency organization, procedure, or practice that do not substantially affect the rights or obligations of non-agency parties. 5 U.S 804(3). EPA is not required to submit a rule report regarding today's action under section 801 because this is a rule of particular applicability.

L. Judicial Review

Under section 307(b)(1) of the Clean Air Act, petitions for judicial review of this action must be filed in the United States Court of Appeals for the appropriate circuit by [INSERT DATE 60 DAYS FROM DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Pursuant to Clean Air Act section 307(d)(1)(B), this action is subject to the requirements of Clean Air Act section 307(d) as it promulgates a FIP under Clean Air Act section 110(c). Filing a petition for reconsideration by the Administrator of this final rule does not affect the finality of this action for the purposes of judicial review nor does it extend the time within which a petition for judicial review may be filed, and shall not

postpone the effectiveness of such rule or action. This action may not be challenged later in proceedings to enforce its requirements. See Clean Air Act section 307(b)(2).

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Incorporation by reference, Intergovernmental relations, Nitrogen dioxide, Particulate matter, Reporting and recordkeeping requirements, Sulfur oxides, Volatile organic compounds.

Dated: November 26, 2012

Lisa P. Jackson,
Administrator.

Title 40, chapter I, of the Code of Federal regulations is amended as follows:

PART 52—[AMENDED]

1. The authority citation for part 52 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

2. Section 52.1170 is amended by adding a new entry at the end of the table in paragraph (e) for "Regional Haze Plan" to read as follows:

§ 52.1170 Identification of plan.

* * * * *

(e) * * *

EPA-Approved Michigan Nonregulatory and Quasi-Regulatory Provisions

Name of nonregulatory SIP provision	Applicable geographic or nonattainment area	State submittal date	EPA approved date	Comments
* * *	* * *	* * *	* * *	
Regional Haze Plan	statewide	11/5/2010	<u>[insert the date of publication in the Federal Register]</u> , <u>[Insert page number where the document begins]</u>	Addresses all regional haze plan elements except BART emission limitations for EGUs, St. Marys Cement, Escanaba Paper, and Tilden Mining

3. Section 52.1183 is amended by adding paragraphs (g), (h), and (i), to read as follows:

§52.1183 Visibility protection.

* * * * *

(g) The requirements of section 169A of the Clean Air Act are not met because the regional haze plan submitted on November 5, 2010, does not meet the best available retrofit technology requirements of 40 CFR 51.308(e) with respect to emissions of NO_x and SO₂ from Saint Marys Cement in Charlevoix and NO_x from Escanaba Paper Company in Escanaba. These requirements for these two facilities are satisfied by 40 CFR 52.1183(h) and 40 CFR 52.1183(i), respectively.

(h)(1) For the 30-day period beginning January 1, 2017, and thereafter, Saint Marys Cement, or any subsequent owner or operator of the Saint Marys Cement facility located in Charlevoix, Michigan, shall not cause or permit the emission of oxides of nitrogen (expressed as NO₂) to exceed 2.80 lb per ton of clinker as a 30-day rolling average.

(2) For the 12-month period beginning January 1, 2017, and thereafter, Saint Marys Cement, or any subsequent owner or operator of the Saint Marys Cement facility located in Charlevoix, Michigan, shall not cause or permit the emission of NO_x (expressed as NO₂) to exceed 2.40 lb per ton of clinker as a 12-month average.

(3) Saint Marys Cement, or any subsequent owner or operator of the Saint Marys Cement facility located in Charlevoix, Michigan,

shall not cause or permit the emission of SO₂ to exceed 7.50 lb per ton of clinker as a 12-month average.

(4) Saint Marys Cement, or any subsequent owner or operator of the Saint Marys Cement facility located in Charlevoix, Michigan, shall operate continuous emission monitoring systems to measure NO_x and SO₂ emissions from its kiln system in conformance with 40 CFR 60 appendix F procedure 1.

(5) The reference test method for assessing compliance with the limit in paragraph (h)(1) of this section shall be use of a continuous emission monitoring system operated in conformance with 40 CFR part 60, appendix F, procedure 1. A new 30-day average shall be computed at the end of each calendar day in which the kiln operates, based on the following procedure: first, sum the total pounds of NO_x (expressed as NO₂) emitted during the operating day and the previous twenty-nine operating days, second sum the total tons of clinker produced during the same period, and third, divide the total number of pounds by the total clinker produced during the thirty operating days.

(6) The reference test method for assessing compliance with the limit in paragraphs (h)(2) and (h)(3) of this section shall be use of a continuous emission monitoring system operated in conformance with 40 CFR part 60, appendix F, procedure 1. A new 12-month average shall be computed at the end of each calendar

month, based on the following procedure: first, sum the total pounds of NO_x or SO₂, as applicable, emitted from the unit during the month and the previous eleven calendar months, second sum the total tons of clinker production during the same period, and third, divide the total number of pounds of emissions of NO_x or SO₂, as applicable, by the total clinker production during the twelve calendar months.

(7) *Recordkeeping.* The owner/operator shall maintain the following records for at least five years:

(i) All CEMS data, including the date, place, and time of sampling or measurement; parameters sampled or measured; and results.

(ii) All records of clinker production, which shall be monitored in accordance with 40 CFR 60.63.

(iii) Records of quality assurance and quality control activities for emissions measuring systems including, but not limited to, any records required by 40 CFR part 60, appendix F, Procedure 1.

(iv) Records of all major maintenance activities conducted on emission units, air pollution control equipment, CEMS and clinker production measurement devices.

(v) Any other records required by 40 CFR part 60, subpart F, or 40 CFR part 60, appendix F, procedure 1.

(8) *Reporting.* All reports under this section shall be submitted to Chief, Air Enforcement and Compliance Assurance Branch, U.S. Environmental Protection Agency, Region 5, Mail Code AE-17J, 77 W. Jackson Blvd., Chicago, IL 60604-3590.

(i) The owner/operator shall submit quarterly excess emissions reports for SO₂ and NO_x BART limits no later than the 30th day following the end of each calendar quarter. Excess emissions means emissions that exceed the emissions limits specified in paragraph (h)(1), (h)(2), and (h)(3) of this section. The reports shall include the magnitude, date(s), and duration of each period of excess emissions, specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions of the unit, the nature and cause of any malfunction (if known), and the corrective action taken or preventative measures adopted.

(ii) Owner/operator of each unit shall submit quarterly CEMS performance reports, to include dates and duration of each period during which the CEMS was inoperative (except for zero and span adjustments and calibration checks), reason(s) why the CEMS was inoperative and steps taken to prevent recurrence, and any CEMS repairs or adjustments.

(iii) The owner/operator shall also submit results of any CEMS performance tests required by 40 CFR part 60, appendix F,

Procedure 1 (Relative Accuracy Test Audits, Relative Accuracy Audits, and Cylinder Gas Audits).

(iv) When no excess emissions have occurred or the CEMS has not been inoperative, repaired, or adjusted during the reporting period, such information shall be stated in the quarterly reports required by paragraphs (h)(7)(i) and (ii) of this section.

(i) Escanaba Paper Company, or any subsequent owner or operator of the Escanaba Paper Company facility in Escanaba, Michigan, shall meet the following requirements and shall not cause or permit the emission of NO_x (expressed as NO₂) to exceed the following limits:

(1) For Boiler 8, designated as EU8B13, a rolling 30-day average limit of 0.35 lb per MMBTU.

(2) A continuous emission monitoring system shall be operated to measure NO_x emissions from Boiler 8 in conformance with 40 CFR part 60, appendix F.

(3) The reference test method for assessing compliance with the limit in paragraph (i)(1) of this section shall be a continuous emission monitoring system operated in conformance with 40 CFR part 60, appendix F. A new 30-day average shall be computed at the end of each calendar day in which the boiler operated, based on the following procedure: first, sum the total pounds of NO_x

emitted from the unit during the operating day and the previous twenty-nine operating days, second sum the total heat input to the unit in MMBTU during the same period, and third, divide the total number of pounds of NOx emitted by the total heat input during the thirty operating days.

(4) For Boiler 9, also identified as EU9B03, a limit of 0.27 lb per MMBTU.

(5) The reference test method for assessing compliance with the limit in paragraph (i)(4) of this section shall be a test conducted in accordance with 40 CFR part 60, appendix A, Method 7.

(6) *Recordkeeping.* The owner/operator shall maintain the following records regarding Boiler 8 and Boiler 9 for at least five years:

(i) All CEMS data, including the date, place, and time of sampling or measurement; parameters sampled or measured; and results.

(ii) All stack test results.

(iii) Daily records of fuel usage, heat input, and data used to determine heat content.

(iv) Records of quality assurance and quality control activities for emissions measuring systems including, but not limited to, any records required by 40 CFR part 60, appendix F, Procedure 1.

(v) Records of all major maintenance activities conducted on emission units, air pollution control equipment, and CEMS.

(vi) Any other records identified in 40 CFR 60.49b(g) or 40 CFR part 60, appendix F, Procedure 1.

(7) *Reporting.* All reports under this section shall be submitted to the Chief, Air Enforcement and Compliance Assurance Branch, U.S. Environmental Protection Agency, Region 5, Mail Code AE-17J, 77 W. Jackson Blvd., Chicago, IL 60604-3590.

(i) Owner/operator of Boiler 8 shall submit quarterly excess emissions reports for the limit in paragraph (i)(1) no later than the 30th day following the end of each calendar quarter. Excess emissions means emissions that exceed the emissions limit specified in paragraph (i)(1) of this section. The reports shall include the magnitude, date(s), and duration of each period of excess emissions, specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions of the unit, the nature and cause of any malfunction (if known), and the corrective action taken or preventative measures adopted.

(ii) Owner/operator of Boiler 8 shall submit quarterly CEMS performance reports, to include dates and duration of each period during which the CEMS was inoperative (except for zero and span adjustments and calibration checks or when Boiler 8 is

not operating), reason(s) why the CEMS was inoperative and steps taken to prevent recurrence, and any CEMS repairs or adjustments.

(iii) Owner/operator of Boiler 8 shall also submit results of any CEMS performance tests required by 40 CFR part 60, appendix F, procedure 1 (Relative Accuracy Test Audits, Relative Accuracy Audits, and Cylinder Gas Audits).

(iv) When no excess emissions have occurred or the CEMS has not been inoperative, repaired, or adjusted during the reporting period, such information shall be stated in the quarterly reports required by paragraph (i)(7) of this section.

(v) Owner/operator of Boiler 9 shall submit reports of any compliance test measuring NOx emissions from Boiler 9 within 60 days of the last day of the test. If owner/operator commences operation of a continuous NOx emission monitoring system for Boiler 9, owner/operator shall submit reports for Boiler 9 as specified for Boiler 8 in paragraphs (i)(7)(i) to (i)(7)(iv) of this section.